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ABSTRACT

Articles published in the past few years documenting thinking about various topics on physical education for children are combined in the six sections of this book. The first section, "Perspectives on Elementary School Physical Education," provides eight articles on elementary school physical education, movement programs, and physical fitness. The second section, "Foundations for Elementary School Physical Education," includes five articles which illustrate the importance of sound foundational knowledge in developing appropriate movement experiences for children. Section 3, "Curriculum Considerations," presents a variety of topics: theoretical constructs of elementary school physical education, program goals, content, competition, gender role stereotyping, public relations, legal issues, and HIV/AIDS. Ten articles in section 4, "Pedagogical Considerations," provide a framework for examining instructional theory and professional practice. Section 5, "Teacher Education for Elementary School Physical Education," highlights the preparation of students as elementary school physical educators (three of five articles are from a conference sponsored by the Council on Physical Education for Children). The final section, "Research on Children and Children's Physical Education," addresses the following topics for researchers' attention: fitness, test reliability, academic learning time in physical education, and student decision-making. (Contains approximately 60 references.) (LL)

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Echoes II

Influences in Elementary School Physical Education

Pamela C. Allison
Editor

Council on Physical Education for Children of the
National Association for Sport and Physical Education

an association of the
American Alliance for Health, Physical Education,
Recreation and Dance

The American Alliance for Health, Physical Education, Recreation and Dance is an educational organization designed to support, encourage, and provide assistance to member groups and their personnel nationwide as they initiate, develop, and conduct programs in health, leisure, and movement-related activities. The Alliance seeks to:

- Encourage, guide, and support professional growth and development in health, leisure, and movement-related programs based on individual needs, interests, and capabilities.
- Communicate the importance of health, leisure, and movement-related activities as they contribute to human well-being.
- Encourage and facilitate research which will enrich health, leisure, and movement-related activities and to disseminate the findings to professionals and the public.
- Develop and evaluate standards and guidelines for personnel and programs in health, leisure, and movement-related activities.
- Coordinate and administer a planned program of professional, public, and government relations that will improve education in areas of health, leisure, and movement-related activities.
- Conduct other activities for the public benefit.

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Foreword

One of the functions of a professional association is to provide its members with up-to-date, thought-provoking information which challenges them to remain well informed and contemporary in their practice. Certainly professionals interested in children's physical education have a need for this type of information as they revise and rethink their programs in attempting to provide children with programs that are relevant, contemporary, and beneficial.

Echoes is a contemporary resource which combines, in a single publication, the most influential articles published in the past few years. It is a project of the Executive Committee of the Council on Physical Education for Children (COPEC) designed to enrich and stimulate not only the 9,000 plus members of COPEC, but also the increasing number of professionals in related areas who are understanding with increasing clarity and insight the value and importance of physical activity in the lives of children.

It has been a quarter of a century since the first edition of *Echoes* was published in 1968. Since that time some things have changed in children's physical education. When the first edition was published, for example, the Council on Physical Education for Children was known as the Elementary School Physical Education Council. Later the name was changed to reflect the fact that the focus of the Council's work expands beyond physical education in elementary schools. In 1977 when the second edition was published, the title of the publication was changed from *Promising Practices* to *Echoes* because the articles selected for the 1977 publication were broader in scope and included theoretical as well as practical pieces. Thus, the publication was more than simply a collection of "promising practices."

Echoes II is really the third in a series documenting the thinking of the leaders of our time about various topics on physical education for children. On behalf of all of the members of COPEC, the Executive Committee wishes to express appreciation to all the authors whose works are included in this document, as well as the editorial committee, for their excellent contribution to the improvement of physical education for children. The true value and impact of your efforts will be reflected in the gyms and on the blacktops of schools across America as contemporary professionals continue to be stimulated by your writing and update their teaching and programs to better educate the children of the 21st century.

George Graham, *Chair*
COPEC Executive Committee, 1991-1992

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Suzie Boos
Bill Stinson
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Preface

Since the publication of *Echoes of Influence* in 1977, much has been said and written about children's physical education. *Echoes II* locates in one source some of the stimulating, innovative, controversial, and useful ideas about physical education for children published during the 15 years since the last *Echoes*. This book includes selected articles and papers appearing in AAHPERD journals (specifically the *Journal of Physical Education, Recreation and Dance, Research Quarterly for Exercise and Sport*, and *Strategies*), in proceedings of NASPE-sponsored conferences, and in other NASPE/AAHPERD materials such as position statements published within the time frame of 1977 to 1992. This collection of ideas serves as an indicator of two things: topics related to elementary school physical education considered to be important to address in the literature and the current state of elementary school physical education.

The selection of materials for inclusion in *Echoes II* was based on specific criteria. It was thought to be important to include articles that identified, shaped, or clarified a trend or an issue in children's physical education. Unique ideas and alternative perspectives on previously presented ideas were also considered important for inclusion. Articles that generated discussion or debate or had an impact within the profession would help define the state of the field. In addition, it was crucial for the writings of leaders in elementary school physical education to be represented in *Echoes II*. No predetermined categories of topics were used to make choices. Once selected, articles fell into natural groupings, which then became the organizing sections for the book.

The result of this selection process is a collection of ideas that has historical significance and contemporary relevance as well as direction for the future. It brings together what was, what is, and what can be with the belief that elementary school physical education will be the best possible experience for the children in our programs.

Any work of this type is naturally a group effort. The editorial committee for this project was composed of dedicated and energetic professionals who went about their tasks with skill and enthusiasm. They were excellent at meeting deadlines. I wish to thank Sam Baumgarten, Bob Pangrazi, Becky Pissanos, Marie Riley, and Kay Siegel for their efforts in the preparation of *Echoes II*. I am most appreciative. Appreciation is also extended to the School of Health, Physical Education and Recreation at Bowling Green State University for their support of this project. To those members of the profession who contribute to the knowledge base of children's physical education through their speeches and writing, acknowledgment of your efforts to stimulate thinking and improve practice is given. Without your words, there would be no echoes.

Pamela C. Allison
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Echoes II:
Influences in Elementary School Physical Education

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Reference List

Allison, P.C., and Collins, K. (1982). Movement education: From cliché to myth to meaning. *Journal of Physical Education, Recreation and Dance*, 53(7), 76-77, 90.

Allison, P.C., Pissanos, B.W., and Sakola, S.P. (1990). Physical education revisited—The institutional biographies of preservice classroom teachers. *Journal of Physical Education, Recreation and Dance*, 61(5), 76-79.

Baker, B.B. (1989). Legal perspectives for elementary school physical education. *Journal of Physical Education, Recreation and Dance*, 60(3), 23.

Barrett, K.R. (1985). The content of an elementary school physical education program and its impact on teacher preparation. In H.A. Hoffman and J.E. Rink (Eds.), *Physical education professional preparation: Insights and foresights* (pp. 9-25). Reston, VA: AAHPERD.

Barrett, K.R. (1988). Two views: The subject matter of children's physical education. *Journal of Physical Education, Recreation and Dance*, 59(2), 42-46.

Barrett, K.R., and Gaskin, L.P. (1990). Running backwards in a relay race: Brown v. Burlington City Board of Education. *Journal of Physical Education, Recreation and Dance*, 61(1), 33-35.

Baumgarten, S. (1988). Nothing short of a revolution. *Journal of Physical Education, Recreation and Dance*, 59(2), 38-41.

Boucher, A. (1978). Educational gymnastics is for everyone. *Journal of Physical Education and Recreation*, 49(7), 48-50.

Boyce, B.A., and Walker, P. (1991). Establishing structure in the elementary school. *Strategies*, 5(2), 38-41.

Brown, C.A. (1986). Elementary school dance: Teaching rhythms and educational forms. *Journal of Physical Education, Recreation and Dance*, 57(2), 39-45.

Buschner, C.A. (1990). Can we help children move and think critically? In W.J. Stinson (Ed.), *Moving and learning for the young child* (pp. 51-66). Reston, VA: AAHPERD.

Capel, S. (1986). Educational gymnastics: Meeting physical education goals. *Journal of Physical Education, Recreation and Dance*, 57(2), 34-38.

Capel, S. (1986). Games and sports: Offering social, competitive, and functional purpose. *Journal of Physical Education Recreation and Dance*, 57(2), 29-33, 45.

Carlson, J.B. (1981). Fathoming feelings in physical education. *Journal of Physical Education and Recreation*, 52(2), 19-21, 54.

Cole, J. (1988). Teaching ultimate frisbee. *Strategies*, 1(5), 8-13.

Connelly, D. (1988). The shy child in physical education. *Strategies*, 1(4), 5-7.

Corbin, C.B., and Pangrazi, R.P. (1992). Are American children and youth fit? *Research Quarterly for Exercise and Sport*, 63, 96-106.

Council on Physical Education for Children. (1986). *Movement programs for young children: A position paper*. Reston, VA: AAHPERD.

Council on Physical Education for Children. (1988). *Guidelines for elementary school physical education: A position paper*. Reston, VA: AAHPERD.

Council on Physical Education for Children. (1992). *Developmentally appropriate physical education practices for children*. Reston, VA: AAHPERD.

Doolittle, S.A., and Girard, K.T. (1991). A dynamic approach to teaching games in elementary PE. *Journal of Physical Education, Recreation and Dance*, 62(4), 57-62.

Entzion, B.J. (1991). A child's view of fairplay. *Strategies*, 5(2), 16-19.

Espiritu, J.K. (1987). Quality physical education programs: Cognitive emphases. *Journal of Physical Education, Recreation and Dance*, 58(6), 38-40.

Graham, G. (1987). Motor skill acquisition: An essential goal of physical education programs. *Journal of Physical Education, Recreation and Dance*, 58(7), 44-48.

Grineski, S. (1992). What is a truly developmentally appropriate physical education program for children? *Journal of Physical Education, Recreation and Dance*, 63(6), 33-35, 60.

Halverson, L.E. (1990). Motor development and physical education for young children. In W.J. Stinson (Ed.), *Moving and learning for the young child* (pp. 85-103). Reston, VA: AAHPERD.

Hanson, M.R. (1983). Physical education for children: A positive look. *Journal of Physical Education, Recreation and Dance*, 54(7), 54, 56.

Hoffman, H.A. (1987). Images of quality for elementary school physical education. *Journal of Physical Education, Recreation and Dance*, 58(6), 44-45.

Horrocks, R.N. (1978). Resolving conflict in the gymnasium. *Journal of Physical Education and Recreation*, 49(7), 61.

Ignico, A.A. (1989). Elementary physical education: Color it androgynous. *Journal of Physical Education, Recreation and Dance*, 60(2), 23-24.

Isaacs, L.D. (1980). Catching performance: Implications for the practitioner. *Journal of Physical Education and Recreation*, 51(8), 56-58.

Keller, M.J. (1992). Children and HIV/AIDS: A role for physical education and recreation professionals. *Journal of Physical Education, Recreation and Dance*, 63(4), 34-36, 40.

Kraft, R.E. (1988). Let the students create the games. *Strategies*, 2(1), 27-28.

Kulewicz, S. (1981). The children, not the games. *Journal of Physical Education and Recreation*, 52(4), 67-69.

Lewandowski, D.M. (1984). Shoestrings and shoeboxes. *Journal of Physical Education, Recreation and Dance*, 55(6), 34-35.

Locke, L.F. (1985). From the Ozarks to Orlando: Now that we understand the question, what's the answer? In H.A. Hoffman and J.E. Rink (Eds.), *Physical education professional preparation: Insights and foresights* (pp. 158-169). Reston, VA: AAHPERD.

Lydon, M.C., and Cheffers, J.T.F. (1984). Decision-making in elementary school-age children: Effects upon motor learning and self-concept development. *Research Quarterly for Exercise and Sport*, 55, 135-140.

Milne, D.C., Haubenstricker, J.L., and Seefeldt, V.D. (1991). Remedial motor education: Some practical suggestions. *Strategies*, 4(4), 15-18.

Pangrazi, R. (1982). Physical education, self-concept, and achievement. *Journal of Physical Education, Recreation and Dance*, 53(9), 16-18.

Parent, S.A. (1978). To arouse an interest. *Journal of Physical Education and Recreation*, 49(7), 32-34.

Petray, C. (1990). Physical Best™: PR tool for the elementary physical educator. *Journal of Physical Education, Recreation and Dance*, 61(7), 23-26.

Pissanos, B.W., and Temple, I.G. (1990). Fitting together—Physical education specialists and classroom teachers. *Journal of Physical Education, Recreation and Dance*, 61(7), 55-61.

Portman, P.A. (1989). Parent intervention program. *Strategies*, 3(2), 13-19.

Rikli, R.E., Petray, C., & Baumgartner, T.A. (1992). The reliability of distance run tests for children in grades K-4. *Research Quarterly for Exercise and Sport*, 63, 270-276.

Ross, J.G., and Pate, R.R. (1987). The National Children and Youth Fitness Study II: A summary of findings. *Journal of Physical Education, Recreation and Dance*, 58(9), 51-56.

Ross, J.G., Pate, R.R., Corbin, C.B., Delpy, L.A., and Gold, R.S. (1987). The National Children and Youth Fitness Study II: What is going on in the elementary physical education program? *Journal of Physical Education, Recreation and Dance*, 58(9), 78-84.

Rupnow, A.A. (1980). Eliminating sex role stereotyping in elementary physical education. *Journal of Physical Education and Recreation*, 51(6), 38.

Sanborn, M.A. (1985). Beyond pedagogy. In H.A. Hoffman and J.E. Rink (Eds.), *Physical education professional preparation: Insights and foresights* (pp. 58-75). Reston, VA: AAHPERD.

Sanborn, M.A., and Meyer, C.L. (1980). Curricular constructs and parameters for today's elementary physical education. *Journal of Physical Education and Recreation*, 51(7), 42-43.

Seefeldt, V. (1984). Physical fitness in preschool and elementary school-aged children. *Journal of Physical Education, Recreation and Dance*, 55(9), 33-37, 40.

Silverman, S., Dodds, P., Placek, J., Shute, S., and Rife, F. (1984). Academic learning time in elementary school physical education (ALT-PE) for student subgroups and instructional activity units. *Research Quarterly for Exercise and Sport*, 55, 365-370.

Standeven, J. (1978). More than simply movement experience. *Journal of Physical Education and Recreation*, 49(7), 35-38.

Stein , J.U. (1988). Competition: A developmental process. *Journal of Physical Education, Recreation and Dance*, 59(3), 30-32.

Stinson, S.W. (1979). Evaluating the child: Issues for dance educators. *Journal of Physical Education and Recreation*, 50(7), 53-54.

Stinson, S.W. (1990). Dance and the developing child. In W.J. Stinson (Ed.), *Moving and learning for the young child* (pp. 139-150). Reston, VA: AAHPERD.

Strohmeyer, H.S., Williams, K., and Schaub-George, D. (1991). Developmental sequences for catching a small ball: A prelongitudinal screening. *Research Quarterly for Exercise and Sport*, 62, 257-266.

Walkwitz, E., and Lee, A. (1992). The role of teacher knowledge in elementary physical education instruction: An exploratory study. *Research Quarterly for Exercise and Sport*, 63, 179-178.

Weiss, M.R., and Bressan, E.S. (1985). Connections—Relating instructional theory to children's psychosocial development. *Journal of Physical Education, Recreation and Dance*, 56(9), 34-36.

Weiss, M.R., Ebbeck, V., and Rose, D.J. (1992). "Show and tell" in the gymnasium revisited: Developmental differences in modeling and verbal rehearsal effects on motor skill learning and performance. *Research Quarterly for Exercise and Sport*, 63, 292-301.

Perspectives on Elementary School Physical Education

Each field of endeavor benefits from being put in perspective and elementary school physical education is no exception. Lenses through which a field views itself need to be provided and brought into focus. The eight articles in this section offer perspectives on children's physical education. *Developmentally Appropriate Physical Education Practices for Children*, *Guidelines for Elementary School Physical Education*, and *Movement Programs for Young Children* are position papers developed by NASPE/COPEC that provide direction for preschool and school programs. Hanson summarizes positive changes and outlines future challenges for children's physical education. Sallis and McKenzie outline the contributions of physical education to children's health, while Ross and his colleagues describe the status of elementary school physical education programs in 1987. Hoffman encourages the development of images of quality central to program excellence, and Allison and Collins describe the dissolution of the meaning of the term "movement education." Each article offers a particular perspective helping to bring the field of elementary school physical education into focus.

Developmentally Appropriate Physical Education Practices for Children

A Position Statement

Developed by the Council on Physical Education for Children
of the National Association for Sport and Physical Education
(an association of the American Alliance for
Health, Physical Education, Recreation and Dance)

Introduction

As we enter the 21st century the importance and value of regular physical activity has been recognized as never before. Accompanying this recognition is the awareness that childhood is the time to begin the development of active and healthy lifestyles.

Children do not automatically develop the skills, knowledge, attitudes, and behaviors that lead to regular and enjoyable participation in physical activity. They must be taught. The responsibility for this instruction is vested primarily in physical education programs in the schools.

In recent years a growing body of research, theory, and practical experience has sharpened our understanding about the beneficial aspects of physical education programs for children—and those that are counterproductive. The purpose of this document is to describe, in a very straightforward way, practices that are both developmentally and instructionally appropriate and inappropriate for children in preschool and elementary school physical education programs.

Quality Physical Education for Children

The Council on Physical Education for Children (COPEC) of NASPE, the nation's largest professional association of children's physical education teachers, believes that quality, daily physical education should be available to all children. Quality physical education is both developmentally and instructionally suitable for the specific children being served. Developmentally appropriate practices in physical education are those which recognize children's changing capacities to move and those which promote such change. A developmentally appropriate physical education program accommodates a variety of individual characteristics such as developmental status, previous movement experiences, fitness and skill levels, body size, and age. Instructionally appropriate physical education incorporates the best known practices, derived from both research and experiences teaching children, into a program that maximizes opportunities for learning and success for all children. The outcome of a developmentally and instructionally appropriate program of physical education is an individual who is "physically educated."

In 1990, the National Association for Sport and Physical Education (NASPE) defined a physically educated person as one who:

- HAS learned the skills necessary to perform a variety of physical activities
- DOES participate regularly in physical activity
- IS physically fit
- KNOWS the implications of and the benefits from involvement in physical activities
- VALUES physical activity and its contributions to a healthful lifestyle.

Appropriate physical education programs for children provide an important first step towards becoming a physically educated person.

Premises of Physical Education Programs for Children

In any discussion of physical education programs for children there are three major premises that need to be understood.

1. Physical education and athletic programs have different purposes.

Athletic programs are essentially designed for youngsters who are eager to specialize in one or more sports and refine their talents in order to compete with others of similar interests and abilities. Developmentally appropriate physical education programs, in contrast, are designed for every child—from the physically gifted to the physically challenged. The intent is to provide children of all abilities and interests with a foundation of movement experiences that will eventually lead to active and healthy lifestyles—athletic competition may be one part of this lifestyle, but it is not the only part.

2. Children are not miniature adults.

Children have very different abilities, needs, and interests than adults. It is inadequate simply to "water down" adult sport or activity programs and assume that they will be beneficial. Children need, and learn from, programs that are designed specifically with their needs and differences in mind.

3. Children in school today will not be adults in today's world.

More than ever before we are in a time of rapid change. Consequently, educators have the challenge of preparing children to live as adults in a world that has yet to be clearly defined and understood. The only certainty is that they will have different opportunities and interests than currently exist. Contemporary programs introduce children to the world of today, while also preparing them to live in the uncertain world of tomorrow. In brief, they help them learn how to learn—and to enjoy the process of discovering and exploring new and different challenges in the physical domain.

Tomorrow's physical activities may look quite different from today's. Present programs need to prepare children with basic movement skills that can be used in any activitiy, whether it be popular today or yet to be invented. Mastery of basic skills encourages the development and refinement of more complex skills leading to the ultimate enjoyment of physical activity for its own sake.

Intended Audience

This document is written for teachers, parents, school administrators, policy makers, and other individuals who are responsible for the physical education of children. It is intended to provide specific guidelines that will help them recognize practices that are in the best interests of children (appropriate) and those that are counterproductive, or even harmful (inappropriate). It needs to be understood that the components described in this statement are, in actuality, interrelated. They are separated here only for purposes of clarity and ease of reading. It should also be understood that these components are not all-inclusive. They do represent, however, most of the characteristics of appropriate programs of physical education for children.

APPROPRIATE AND INAPPROPRIATE PHYSICAL EDUCATION PRACTICES

Appropriate Practice	***Inappropriate Practice***
Component: Curriculum The physical education curriculum has an obvious scope and sequence based on goals and objectives that are appropriate for all children. It includes a balance of skills, concepts, games, educational gymnastics, rhythms and dance experiences designed to enhance the cognitive, motor, affective, and physical fitness development of every child.	**Component: Curriculum** The physical education curriculum lacks developed goals and objectives and is based primarily on the teacher's interests, preferences, and background rather than those of the children. For example, the curriculum consists primarily of large group games.
Component: Development of movement concepts and motor skills Children are provided with frequent and meaningful age appropriate practice opportunities that enable individuals to develop a functional understanding of movement concepts (body awareness, space awareness, effort and relationships) and build competence and confidence in their ability to perform a variety of motor skills (locomotor, nonlocomotor, and manipulative).	**Component: Development of movement concepts and motor skills** Children participate in a limited number of games and activities where the opportunity for individual children to develop basic concepts and motor skills is restricted.
Component: Cognitive development Physical education activities are designed with both the physical and the cognitive development of children in mind. Teachers provide experiences that encourage children to question, integrate, analyze, communicate, apply cognitive concepts, and gain a wide multi-cultural view of the world, thus making physical education a part of the total educational experience.	**Component: Cognitive development** Instructors fail to recognize and explore the unique role of physical education, which allows children to learn to move while also moving to learn. Children do not receive opportunities to integrate their physical education experience with art, music, and other classroom experiences.
Component: Affective development Teachers intentionally design and teach activities throughout the year that allow children the opportunity to work together to improve their emerging social and cooperation skills. These activities also help children develop a positive self-concept. Teachers help all children experience and feel the satisfaction and joy that results from regular participation in physical activity.	**Component: Affective development** Teachers fail to intentionally enhance the affective development of children when activities are excluded which foster the development of cooperation and social skills. Teachers ignore opportunities to help children understand the emotions they feel as a result of participation in physical activity.

Appropriate Practice	*Inappropriate Practice*
Component: Concepts of fitness Children participate in activities that are designed to help them understand and value the important concepts of physical fitness and the contribution they make to a healthy lifestyle.	**Component: Concepts of fitness** Children are required to participate in fitness activities, but are not helped to understand the reasons why.
Component: Physical fitness tests Ongoing fitness assessment is used as part of the ongoing process of helping children understand, enjoy, improve, and/or maintain their physical health and well-being. Test results are shared privately with children and their parents as a tool for developing their physical fitness knowledge, understanding and competence. As part of any ongoing program of physical education, children are physically prepared so they can safely complete each component of a physical test battery.	**Component: Physical fitness tests** Physical fitness tests are given once or twice a year solely for the purpose of qualifying children for awards or because they are required by a school district or state department. Children are required to complete a physical fitness test battery without understanding why they are performing the tests or the implications of results as they apply to their future health and well-being. Children are required to take physical fitness tests without adequate conditioning (e.g., students are made to run a mile after "practicing" it only one day the week before).
Component: Calisthenics Appropriate exercises are taught for the specific purpose of improving the skill, coordination, and/or fitness levels of children. Children are taught exercises that keep the body in proper alignment, thereby allowing the muscles to lengthen without placing stress and strain on the surrounding joints, ligaments and tendons (e.g., the sitting toe touch).	**Component: Calisthenics** Children perform standardized calisthenics with no specific purpose in mind (e.g., jumping jacks, windmills, toe touches). Exercises are taught which compromise body alignment and place unnecessary stress on the joints and muscles (e.g., deep-knee bends, ballistic [bouncing] stretches, and standing straight-legged toe touches).
Component: Fitness as punishment Fitness activities are used to help children increase personal physical fitness levels in a supportive, motivating, and progressive manner, thereby promoting positive lifetime fitness attitudes.	**Component: Fitness as punishment** Physical fitness activities are used by teachers as punishment for children's misbehavior (e.g., students running laps, or doing push-ups, because they are off-task or slow to respond to teacher instruction).
Component: Assessment Teacher decisions are based primarily on ongoing individual assessments of children as they participate in physical education class activities (formative evaluation), and not on the basis of a single test score (summative evaluation). Assessment of children's physical progress and achievement is used to individualize instruction, plan yearly curriculum and weekly lessons, identify children with special needs, communicate with parents, and evaluate the program's effectiveness.	**Component: Assessment** Children are evaluated on the basis of fitness test scores or on a single physical skill test. For example, children receive a grade in physical education based on their scores on a standardized fitness test or on the number of times they can continuously jump rope.

Appropriate Practice	*Inappropriate Practice*
Component: Regular involvement for every child Children participate in their regularly scheduled physical education class because it is recognized as an important part of their overall education.	**Component: Regular involvement for every child** Children are removed from physical education classes to participate in classroom activities and/or as a punishment for not completing assignments or for misbehavior in the classroom.
Component: Active participation for every child All children are involved in activities that allow them to remain continuously active. Classes are designed to meet a child's need for active participation in all learning experiences.	**Component: Active participation for every child** Activity time is limited because children are waiting in lines for a turn in relay races, to be chosen for a team, or because of limited equipment or playing games such as Duck, Duck, Goose. Children are organized into large groups where getting a turn is based on individual competitiveness or aggressive behavior. Children are eliminated with no chance to reenter the activity, or they must sit for long periods of time. For example, activities such as musical chairs, dodgeball and elimination tag provide limited opportunities for many children, especially the slower, less agile ones who actually need activity the most.
Component: Dance/Rhythmical experiences The physical education curriculum includes a variety of rhythmical, expressive, and dance experiences designed with the physical, cultural, emotional, and social abilities of the children in mind.	**Component: Dance/Rhythmical experiences** The physical education curriculum includes no rhythmical, expressive, or cultural dance experiences for children. Folk and square dances (designed for adults) are taught too early or to the exclusion of other dance forms in the curriculum or are not modified to meet the developmental needs of the children.
Component: Gymnastics Children are encouraged to sequentially develop skills appropriate to their ability and confidence levels in noncompetitive situations centering on the broad skill areas of balancing, rolling, jumping and landing, and weight transfer. Children are able to practice on apparatus designed for their confidence and skill level, and can design sequences which allow for success at their personal skill level.	**Component: Gymnastics** All students are expected to perform the same predetermined stunts and routines on and off apparatus, regardless of their skill level, body composition, and level of confidence. Routines are competitive, are the sole basis for a grade, and/or must be performed solo while the remainder of the class sits and watches.
Component: Games Games are selected, designed, sequenced, and modified by teachers and/or children to maximize the learning and enjoyment of children.	**Component: Games** Games are taught with no obvious purpose or goal, other than to keep children "busy, happy, and good."

Appropriate Practice	***Inappropriate Practice***
Component: Rules governing game play	**Component: Rules governing game play**
Teachers and/or children modify official rules, regulations, equipment and playing space of adult sports to match the varying abilities of the children.	Official, adult rules of team sports govern the activities in physical education classes, resulting in low rates of success and lack of enjoyment for many children.
Component: Forming teams	**Component: Forming teams**
Teams are formed in ways that preserve the dignity and self-respect of every child. For example, a teacher privately forms teams by using knowledge of children's skill abilities or the children form teams cooperatively or randomly.	Teams are formed by "captains" publicly selecting one child at a time, thereby exposing the lower-skilled children to peer ridicule. Teams are formed by pitting "boys against the girls," thereby emphasizing gender differences rather than cooperation and working together.
Component: Gender directed activities	**Component: Gender directed activities**
Girls and boys have equal access to individual, partner, small group, and team activities. Both girls and boys are equally encouraged, supported, and socialized towards successful achievement in all realms of physical activities. Statements by physical education teachers support leadership opportunities and provide positive reinforcement in a variety of activities that may be considered gender-neutral.	Girls are encouraged to participate in activities that stress traditionally feminine roles, while boys are encouraged to participate in more aggressive activities. Boys are more often provided with leadership roles in physical education class. Statements by physical education teachers reinforce traditional socialization patterns that provide for greater and more aggressive participation by boys and lesser and more passive participation by girls.
Component: Number of children on a team	**Component: Number of children on a team**
Children participate in team games (e.g., 2-3 per team) that allow for numerous practice opportunities while also allowing them to learn about the various aspects of the game being taught.	Children participate in full sided games (e.g., the class of 30 is split into two teams of 15 and these two teams play each other) thereby leading to few practice opportunities.
Component: Competition	**Component: Competition**
Activities emphasize self-improvement, participation, and cooperation instead of winning and losing. Teachers are aware of the nature of competition and do not **require** higher levels of competition from children before they are ready. For example, children are allowed to choose between a game in which score is kept and one that is just for practice.	Children are **required** to participate in activities that label children as "winners" and "losers." Children are **required** to participate in activities that compare one child's or team's performance against others (e.g., a race in which the winning child or team is clearly identified).
Component: Success rate	**Component: Success rate**
Children are given the opportunity to practice skills at high rates of success adjusted for their individual skill levels.	Children are asked to perform activities that are too easy or too hard, causing frustration, boredom, and/or misbehavior. All children are expected to perform to the same standards with no allowance for individual abilities and interests.

Appropriate Practice	*Inappropriate Practice*
Component: Class size Physical education classes contain the same number of children as the classrooms (e.g., 25 children per class).	**Component: Class size** Children participate in a physical education class that includes more children than the classroom. (For example, two or more classrooms are placed with one certified teacher and one or more teacher aides.)
Component: Days per week and length of class time Children are given the opportunity to participate daily in scheduled, instructional physical education throughout the year, exclusive of recess. Length of class is appropriate for the developmental level of the children.	**Component: Days per week and length of class time** Children do not receive daily, instructional physical education. Children's age and maturational levels are not taken into account when physical education schedules are developed.
Component: Facilities Children are provided an environment in which they have adequate space to move freely and safely. Both inside and outside areas are provided so that classes need not be canceled, or movement severely limited, because of inclement weather.	**Component: Facilities** Physical education classes are regularly held in a school hallway or in a classroom thereby restricting opportunities to move freely and without obstructions.
Component: Equipment Enough equipment is available so that each child benefits from maximum participation. For example, every child in a class would have a ball. Equipment is matched to the size, confidence and skill level of the children so that they are motivated to actively participate in physical education classes.	**Component: Equipment** An insufficient amount of equipment is available for the number of children in a class (e.g., one ball for every four children). Regulation or "adult size" equipment is used that may inhibit skill development, injure, and/or intimidate the children.
Component: Physical education and recess Physical education classes are planned and organized to provide children with opportunities to acquire the physical, emotional, cognitive, and social benefits of physical education.	**Component: Physical education and recess** "Free-play," or recess, is used as a substitute for daily, organized physical education lessons. Free-play, in this case, is characterized by a lack of goals, organization, planning and instruction.
Component: Field days The field day, if offered, is designed so that every child is a full participant and derives a feeling of satisfaction and joy from a festival of physical activity. Opportunities are provided for children to voluntarily choose from a variety of activities that are intended purely for enjoyment.	**Component: Field days** Fields days, if offered, are designed so that there is intense team, group, or individual competition with winners and losers clearly identified. One or two children are picked to represent an entire class, thereby reducing others to the role of spectator.

Guidelines for Elementary School Physical Education

A Position Paper

Prepared by the Council on Physical Education for Children of the
National Association for Sport and Physical Education (an association of the
American Alliance for Health, Physical Education, Recreation and Dance)

STATEMENT

The purpose of this position paper is to serve as a guide for teachers, administrators, curriculum planners, and educational consultants, as they develop programs of physical education for elementary school children. The paper represents the thinking of many people closely working with children and reflects the most current thinking about elementary school physical education. This position paper also reflects current federal legislation regarding equity for all children regardless of race, creed, sex, or handicapping condition.

FOREWORD

Physical education is an integral part of the total educational program. It offers a unique contribution in the development of knowledge, understanding, and positive attitudes concerning human movement as well as physical fitness. The degree of success the elementary child experiences in work and play is influenced by her/his ability to execute movement patterns effectively and efficiently.

For the child, movement is one of the most utilized means of nonverbal communication, expression, and learning. Through movement, impressions about self and environment are formed. In some observable and learned form, movement underlies nearly all of human accomplishments. To become a fully functioning individual, the child needs many opportunities to participate in well-conceived, well-taught learning experiences in physical education. Achieving this objective requires identification of the essential characteristics of a quality daily program of physical education for the elementary schools.

In the continuing quest to make physical education experiences more relevant and personal to children, new developments in learning theories, structuring of the subject matter, and new perceptions concerning growth and development of children must be constantly considered, evaluated, and implemented. The teacher plays a vital role in the success of the physical education program and priority should be given to employing a qualified elementary school physical education specialist to maximize student learning and achievement.

THE CHILD

We Believe That:

1. Each child is a unique individual with a differing rate of development and different physical, mental, emotional, and social needs.
2. Each child has differing abilities and aptitudes for learning motor skills. The rate and style at which motor skills are mastered also differ among children and within each child from time to time.
3. Every child has the right to experience success in physical education.

4. Each child should have continuous and progressive learning experiences in physical education each year in school. These experiences should begin at the preschool level.

5. Through the teaching of carefully planned and purposeful physical education experiences, the child:
  a. increases understanding of self and environment;
  b. becomes more proficient in motor skills and general body management, thus allowing more active participation in a variety of life experiences;
  c. improves in muscular strength, muscular endurance, flexibility, agility, balance and coordination, cardiovascular/respiratory function, and in knowledge and understanding of how these factors relate to lifelong health and physical fitness;
  d. gains a positive attitude toward physical activity.

THE TEACHER

We Believe That:

1. Teachers of elementary school physical education must be able to integrate knowledge and understanding of human movement, child growth and development, and current learning theories in order to provide meaningful physical education experiences.

2. Elementary school physical education teachers must be able to work effectively with children by observing, assessing, and refining children's motor performance in addition to other aspects of their development.

3. Elementary school physical education teachers should be involved, contributing members of the school. The teacher should keep abreast of trends, issues, and new developments by reading, in-service workshops, and participation in local, state, and national professional organizations.

4. Physical education teachers and classroom teachers should work together to develop an in-depth understanding of children in order to provide a program which is commensurate with the needs of each child.

5. When classroom teachers have the full responsibility for the total education program, including physical education, they should be provided with regular access to resource people who are qualified by education and experience to give leadership and guidance pertaining to elementary school physical education in areas such as selection of content, progression and continuity, etc.

TEACHER PREPARATION/ STAFF DEVELOPMENT

We Believe That:

1. Professional preparation for the elementary school physical education teacher should focus on the child in preschool through grade six. The curricula should result in the prospective teacher being competent in:
  a. understanding child growth and development, with an emphasis on motor development;
  b. a knowledge of and appreciation for the structure and function of human movement;
  c. observing and assessing children and their movements;
  d. the knowledge and assessment of health-related and skill-related aspects of physical fitness;
  e. a knowledge of learning processes, teaching strategies, and factors that affect motor learning;
  f. developing curriculum with emphasis on curriculum designs and strategies appropriate for elementary school programs;
  g. assessing and working with children who have special needs;
  h. personal skills and teaching skills in the content area of fundamental movement patterns, games/sports, dance, gymnastics, and aquatics to meet the needs and interests of children in kindergarten through grade six.

2. In addition, teacher preparation/staff development will provide:
  a. laboratory and field experiences that are directed and supervised throughout the teacher preparation program;
  b. opportunities to become acquainted with a variety of elementary school organizational structures and the administration of physical education within those settings. The professional preparation curricula should culminate in certification specific for teaching children in the elementary grades.

3. Preparation for the classroom teacher should include an understanding of the relationship of physical growth and motor development to the total development and learning experience of the child. Course work in movement skills, methods, and appropriate content of elementary school physical education programs should be required. Laboratory assignments which provide for experiences with children in physical education are essential.

4. Continuous staff development opportunities should be provided to meet the individual needs of educators concerned with physical education programs for children. Teachers in the field should be involved in the planning of such programs.

5. Personnel concerned with teacher preparation and staff development in physical education should have continuous interaction with children. They need also to be aware of current research and legislation and be able to interpret them for application.

INSTRUCTIONAL PROGRAM

We Believe That:

1. A well-conceived and well-executed program of physical education should be designed to help each child become a more self-directed, self-reliant, and fully functioning individual.

2. A comprehensive physical education program for all children has as its foundation learning experiences which are designed to help each child develop efficient, effective, and expressive movement situations. Such experiences should serve the divergent needs of all pupils—the gifted, the slow learner, the handicapped, the culturally deprived, and the average. All programs should allow for the developmental needs of each child.

3. Physical fitness is one of the many important outcomes of a quality physical education program. Children derive immediate health benefits from sustained participation in vigorous physical activity. Optimum development of the musculoskeletal and cardiorespiratory systems is enhanced through children's regular participation in planned programs designed by professional physical educators to maximize movement skill development through sequenced instruction.

The far-reaching effects of achieving physical fitness through physical education are manifested in children's emerging attitudes and knowledges. By integrating physical fitness into the broad range of activities which children enjoy, a bond is established between gaining or maintaining fitness and having fun while playing alone or with friends. This positive approach to pursuing fitness within children's movement forms, in addition to focusing on the fitness outcomes, is central to the pursuit of a lifetime of physical activity.

Along with the integration of positive attitudes and acquisition of movement skills, the physical educator provides opportunity for cognitive learning about physical fitness. Through activities which explore the various kinds of fitness, levels of fitness, and means for attaining, maintaining, and measuring fitness, children become familiar with those key concepts that will help them make wise decisions in the future about their own participation in physical activities.

By conducting regular, vigorous physical education programs and emphasizing skill instruction, children become skillful movers and fitness results. By sharing accurate information about fitness, professional educators equip children with the tools for healthful living as they develop the skills, attitudes, and knowledges essential for making intelligent choices about their future.

4. The instructional program should include learning experiences which will help each child develop skill in fundamental movement patterns, games/sports, dance, gymnastics, and aquatics. The program should be designed to:

a. provide specific outcomes in the psychomotor, cognitive, and affective areas;
b. develop motor skills and efficient movement patterns;
c. encourage vigorous activity and help each child achieve the highest level of physical and health-related fitness of which he/she is capable;
d. help develop an understanding and appreciation of movement as a participant as well as an observer;
e. emphasize safety practices;
f. foster creativity and encourage expression and communication in movement;
g. promote self-understanding and acceptance;
h. promote social interaction;
i. help each child learn how to handle risk-taking, winning, losing, and all other challenges.

These include teacher-directed as well as self-directed learning. If learning is to be personalized and also concerned with the cognitive and affective domains, decision-making must be shared by the teacher and the learner.

EVALUATION

We Believe That:

1. Evaluation must be a continuous and vital part of the physical education program. It is used to determine and clarify purposes, to assess individual student progress toward achieving program objectives, and to improve teaching. The evaluation process:

a. should be utilized for diagnostic/prescriptive teaching;

b. is essential in the guidance of children toward the attainment of acceptable goals and in motivation of children and teachers to effect needed improvement;

c. provides the basis for assessing the behavioral response of the learner in relation to the planned learning experiences and the development of learning experiences to follow;

d. should be utilized as one means of describing the program to parents and the community in order to provide for a better understanding of educational values and outcomes.

2. A variety of evaluative techniques should be used for determining individual differences and needs of elementary school children. Such techniques should include the use of class discussion, knowledge testing, anecdotal records, and assessment of motor skill development and health-related fitness as well as teacher observation of attitudes and feelings. In schools where grading is mandated, these techniques should be taken into consideration.

3. It is more important to observe records of each child's progress than to consider the child's rank in relation to other children and/or national norms.

4. Provision should be made for periodic evaluation of the total physical education program by teachers, administrators, parents, and other qualified individuals. Particular attention should be given to the philosophy, instructional program, facilities, equipment, administrative support, and allocation of school resources.

ORGANIZATION/ADMINISTRATION

We Believe That:

1. Pupils in elementary school should participate in an instructional program of physical education for a minimum of 150 minutes per week in addition to time allotted for free and/or supervised play. House Concurrent Resolution 97 (the Senate concurring) of the 100th Congress was passed to encourage state and local governments and local educational agencies to provide high quality *daily* physical education programs.

The following considerations should be made in scheduling physical education instruction:

a. to best serve the growth, development, and activity needs of children, a daily program is necessary;

b. the length of the class period must be appropriate to the needs and maturation of the learner, with 30 minutes as a suggested minimum;

c. the time allocated for instruction should be exclusive of time used for dressing, showering, recess, free and/or supervised play periods, and noon-hour activities.

2. Groups for instruction in physical education should reflect the intent of Title IX regulations.

3. The physical education program should reflect the intent of Public Law 94-142 and Section 504 of Public Law 93-112.

4. The physical education class size should be consistent with those of other subject areas and/or self-contained classes. Class groupings must be flexible enough to provide for differences in interests, levels of maturity, size, abilities, and needs.

5. Consideration of the teaching load is crucial to effective, high quality teaching. Personnel responsible for scheduling must consider the following factors:

a. the physical education teacher needs time to plan as well as to teach the program, to coordinate the total program, to consult with teachers, principals, resource teachers, and parents, and to work with children needing additional help;

b. teachers who travel between schools during the day should be given adequate time for travel and preparation to ensure that they can function effectively as members of the teaching teams in the schools to which they are assigned;

c. the number of preparations, length of class periods, number of children with whom the teacher will come in contact per day/per week, total number of classes, and the number of hours in the school day should be the criteria for determining teaching load. It is recommended that the physical education teacher's class load not exceed the equivalent of nine 30-minute periods a day. It is highly desirable to reserve at least five minutes between classes to enable the teacher to talk to individual students, make teaching notes, change equipment, confer with the classroom teacher, and to adjust from the group leaving to the group arriving. Consideration should be given to scheduling primary and intermediate classes in teaching blocks for better utilization of instructional time and organization of equipment.

6. Students and teachers should be appropriately dressed for the types of activities being conducted. Concern for freedom and quality of movement, and safety, should influence the type of attire worn.

EQUIPMENT AND FACILITIES

We Believe That:

1. Boards of education, through their regular school budget, should provide:
   a. funds for the purchase and maintenance of physical education supplies and equipment;
   b. physical education facilities for school and community use.

2. Standards for the purchase of supplies and equipment should be developed jointly by the physical education teachers and the school administrators.

3. If children are to be physically active and fully involved in the learning situation, ample equipment and supplies that vary in size, texture, etc. for each child are as essential as pencils and books. One ball, one rope, etc. per child is necessary for maximum learning to take place.

4. Sufficient indoor and outdoor facilities and equipment should be provided in each elementary school and should be assigned primarily for physical education activities. Apparatus should be selected or designed for its developmental and educational value. It is equally important to provide adequate space for proper and safe storage of equipment.

5. School and community facilities and programs should be planned and used to supplement one another in serving children's needs.

6. "All-weather surfaces" should be provided and a portion properly marked with circles, lines, courts, etc. to permit participation in a wide variety of activities appropriate for various age levels.

7. Natural play areas should be retained/designed to permit creative and exploratory types of play. Grassy and hilly areas are as important as all-weather surfaces.

8. Plans for new physical education facilities are the responsibility of the community as well as the school, and should be developed in cooperation with physical education teachers, principals, and other resource persons.

SCHOOL-RELATED PROGRAMS

We Believe That:

1. The physical activity needs of elementary school age children can best be served through a program of instruction in physical education supplemented by other opportunities for participation provided by school, home, and community.

2. Enrichment programs should provide opportunities for further development of knowledge and skills gained in the instructional physical education program during such periods as recess, noon hour, and extended school-day programs. The program should be varied in content and organization to provide for all levels of skill.

3. Intramural programs for continued participation in games, recreational sports, dance, gymnastics, and other activities should be offered to all children. This program usually starts in the intermediate grades as the children's desire for participation and group identification begins to emerge.

4. Competition at the elementary school level is a vital and forceful educational tool. It can stimulate a keen desire for self-improvement and create environments in which children, motivated by common purpose, unite in an effort to accomplish goals. However, to be beneficial, competition must be success-oriented for all children and relevant to the school program. Carefully structured competitive experiences within the school, involving individual and group opportunities and conducted to achieve specific instructional objectives, are usually more congruent with elementary education goals than are inter-school competitive programs. Consideration of inter-school competitive programs should follow only after a sound physical education program has been provided for all the children in the elementary school, including an intramural program for the upper elementary grades.

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Movement Programs for Young Children

A Position Paper

Developed by the Council on Physical Education for Children of the
National Association for Sport and Physical Education (an association of the
American Alliance for Health, Physical Education, Recreation and Dance), 1986

INTRODUCTION

The purpose of this position paper is to assist school personnel, community leaders, and parents in determining focus and direction as they develop programs of physical education for preschool children. This paper represents the thinking of numerous professionals in the area of preschool physical education.

In the continuing quest to make physical education experiences more relevant and personal to children, new developments in research on learning theories, curriculum content, instructional strategies, and child growth and development must be constantly considered, evaluated, and implemented. Since teachers play a vital role in the success of movement programs, priority should be given to employing persons with knowledge concerning children's motor development as well as cognitive and affective development. Professionals with this knowledge can design appropriate movement experiences to maximize student learning and achievement.

PURPOSE/IMPORTANCE OF MOVEMENT FOR PRESCHOOL CHILDREN

Play has often been termed the work of young children. It is through play that children learn to move and move to learn. For children, movement is a critical means of nonverbal communication, expression, and learning. Planned movement experiences are an integral part of the total educational program for young children. Movement serves as the basis for their psychomotor, cognitive, and affective development.

Psychomotor Development

Play experiences should include activities that enhance the development of the large and small muscles of the body. Large muscle development, which is sometimes called gross motor development, should include experiences in which children execute locomotor, manipulative, and stability (balance) movement patterns effectively, efficiently, and under a variety of conditions.

Locomotor experiences should involve traveling or steplike actions such as walking, running, hopping, galloping, and skipping as well as rocking, rolling, and sliding actions. Manipulative experiences should involve throwing, catching, striking with and without implements, kicking, and trapping or collecting actions. Stability experiences should involve balancing in a variety of shapes using different bases of support. Upright and inverted balances, static and dynamic balances, and balances which involve weight transfer should also be included.

Small muscle development should include activities that involve bilateral, unilateral, lead-assist, and crosslateral actions as well as experiences for control, strength, and various eye/hand and eye/foot coordinations. Both large and small muscle experiences should range from those which are direct in order to teach a specific skill to those which are open-ended, problem solving, or exploratory in nature so as to encourage creative responses and conceptual development.

Cognitive Development

Experiences in total body movement contribute to cognitive development. As children learn the identification of body parts, how they move, and where they move, they begin to develop an understanding of body and spatial awareness. Knowledge of how the body moves develops an initial understanding of mechanical principles. Activities that involve changes in body shape and movement in different pathways, speeds, and amounts of force further increase children's cognitive base. Early opportunities for a variety of practical, concrete experiences serve to develop a sound base for the more abstract forms of later cognition. Simple experiences in answering questions and forming solutions to movement problems can also contribute to the development of reasoning, deductive and inductive thinking.

Affective Development

Movement experiences for children should be designed to enhance self-concept. Experiences should focus on success not failure, and cooperation not competition, in order to improve the image which youngsters have of themselves, of others, and of others toward them. While they are receiving and responding to information in an adult-directed world, their experiences should also encourage independence and self-responsibility. Creativity, a sense of caring, and appreciation of others and the world are additional concepts that should be fostered in children as they begin to develop attitudes and values as well as a system for moral and ethical decision making.

BELIEFS ABOUT YOUNG CHILDREN

1. Each child is unique, with interests, needs, and responses different from those of every other child. Acknowledging, respecting, and planning in ways to accommodate these individual differences is important if each child is to reach his or her potential. Movement programs should be equitable for all children regardless of race, creed, gender, or handicapping conditions.

2. Children are "whole" beings who bring their thinking, feeling, and moving capacities to every task. Children and their responses are best understood in light of their wholistic nature, and movement experiences can best be planned and conducted when their potential impact upon the whole child is considered.

3. Young children have a natural curiosity and drive for independence. They seek to discover and learn on their own as they explore their environment through movement. They should be taught to set their own goals and be provided with the skills and encouragement to become increasingly independent learners.

4. Young children are free-spirited individuals who exhibit spontaneity, creativity, exuberance, and imaginative self-expression. These characteristics contribute to learning and to the enjoyment of life when fostered and channeled by teachers rather than being subdued or controlled.

5. Young children are "now" persons. Each new day must have time for the happiness and development that good movement experiences can provide. Deferring or substituting other experiences in place of movement classes is an unfair penalty for children.

6. Young children love to move; for them, movement is an end in itself. The joy of doing, not the joy of winning, appeals to this age child. Their absorption in movement practice and play is a sign of appropriate selection and duration of learning tasks and activities.

TEACHERS OF YOUNG CHILDREN

Teachers of movement programs for young children should possess these personal characteristics:

1. Good health, vitality, and enthusiasm.
2. Intelligence, creativity, and an interest in innovation.
3. Willingness to share their ideas with others.
4. Cheerfulness, sense of humor, and a playful spirit.
5. Flexibility and open-mindedness to new programs and ideas.
6. Feelings of self-worth and a valuing and enjoyment of others.
7. Belief in the dignity, worth, and individuality of each child.
8. Sensitivity, warmth, and a capacity for empathy.
9. Basic motor skills and enjoyment of movement.

Teachers of movement programs for young children should possess knowledge relative to:

1. Program planning and development.
2. Motor development and motor learning theory.
3. Perceptual-motor development, principles of fitness development, and movement education.
4. Teaching strategies and classroom program management.
5. Creation of learning environments, learning materials, and equipment.
6. Evaluation of motor performance, teaching effectiveness, and movement programs.

Teachers of movement programs for young children should possess these competencies:

1. Ability to translate motor development, motor learning, and human movement theory into practice.
2. Ability to formulate objectives and plan lessons that will maximize psychomotor learning.
3. Ability to effectively organize, manage, and teach young children so that they achieve in the areas of perceptual-motor development, movement education, and fitness.
4. Ability to create learning environments, learning materials, and equipment which will enhance movement learning.
5. Ability to evaluate motor performance, teaching effectiveness, and movement programs.

CURRICULUM FOR YOUNG CHILDREN

Perceptual-Motor Development

Perceptual-motor aspects of the program should enable children to use sensory information in the process of learning and refining motor skills. A progression of learning experiences should be provided in the categories listed below:

1. Body Image: identification of body parts, knowledge of body size.

2. Visual Perception: observational ability, visual sequential memory, visual tracking, figure-ground discrimination, visual-motor timing.

3. Auditory Perception: auditory awareness, auditory sequential memory, auditory discrimination, use of sound cues in performance.

4. Proprioception (Tactile, Vestibular, Deep Pressure, Kinesthetic Perception): proprioceptive awareness, proprioception to guide movement.

Movement Education

Games

Games for young children should focus on the development and improvement of skill in locomotion and the manipulative patterns of throwing, catching, kicking, and striking with and without implements. While stressing the process of quality movement, emphasis should be placed on learning to control one's body and objects under conditions that allow skills to be utilized in a variety of situations.

Child designed and/or teacher designed games should be governed by simple rules, maximum participation, and nonelimination. Experiences that test one's own skill, encourage cooperation with a partner or small group, and highlight self-improvement rather than winning at someone else's expense should characterize children's games.

Educational Gymnastics

Gymnastics enable children to gain control over their bodies while discovering unique ways of moving alone or with others on the floor or in relation to apparatus. Gymnastics experiences should include the following themes: balancing; traveling, including locomotion, climbing, rocking, rolling, sliding, and flight; transferring weight from one adjacent body part to another; and force production and absorption, including jumping and landing.

In educational gymnastics the equipment most frequently incorporated in the lessons is small and may include items such as ropes, hoops, and wands. Apparatus is often homemade or improvised and includes wooden or plastic boxes or crates, benches, walking boards, beams, and low tables. Commercial apparatus that has been designed for children and can be rearranged to provide a variety of challenges is also desirable.

Dance

Dance provides opportunities for interpretive, expressive, and communicative movement. Experiences in dance for children should evolve from the use of the movement elements of space, time, and force. Children should learn the relationship of self to others and to the physical environment. Creative dance experiences should include exploration, improvisation, investigation, and invention using ideas such as those associated with the movement elements, imaginary and literary sources, properties or characteristics of various plants, objects, or animals in the environment, and music as well as other types of sound accompaniment.

Children should develop an awareness of rhythm through dance. Opportunities to experiment with basic locomotor and nonlocomotor movements, making combinations of these movements, action songs, singing games, and traditional dance steps are essential components of a quality dance program for children.

Fitness

Children should be introduced to active lifestyles and encouraged to exercise through play. Contemporary technology including television, computers, and automated toys often places children in an environment that deprives them of sufficient vigorous movement experiences. Adults as parents and/or teachers should actively encourage children to engage in physical activity; sending children out for recess is not enough.

Patterns of exercise balanced with good nutrition and the components of health-related fitness should be presented to young children in terms they understand. Children should be engaged in the discussion of fitness concepts and simple activities in ways that are enjoyable and successful for them. Awareness of child development factors such as attention span, motivation, muscular strength, and endurance should be evidenced by changes of activity and short vigorous periods of exercise followed by brief periods of rest to allow for recovery.

Aquatics

Aquatic experiences are desirable for children if qualified staff and suitable facilities are available. Private, school, or community pools, hot tubs, lakes, rivers, and oceanfronts all provide children opportunities to be introduced to an aquatic environment. Aquatic experiences should include water play to overcome fear of the water, water safety to learn routines of safe behavior around water, and swimming instruction to learn the basics of flotation and stroke technique.

SUMMARY

Movement is the learning of young children. Through movement and play experiences young children learn about themselves and their world. The educational curriculum of preschool children should include experiences in games, gymnastics, and dance. Perceptual-motor development and basic movement skills should serve as the base for experiences in games, gymnastics, and dance. Fitness concepts and the importance of a healthy lifestyle should be introduced to children at any early age. Instructional movement and play should be included daily in the planned educational curriculum of young children.

Physical Education for Children
A Positive Look

Margie R. Hanson

Today's budget cuts, attacks on education, erosion of programs, and loss of teachers may easily discourage professionals about the status of physical education. At such times, it is helpful to reflect on the many positive aspects of elementary physical education.

Educators have made strides on many fronts in the last decade. These can be documented by looking at the increased number of specialists, the level of interest in elementary physical education in the Alliance, new curriculum developments, interest in teacher behavior, and widespread conferences. Resource materials, textbooks,equipment, and films proliferate. The focus on the child, the teacher, the undergraduate, the graduate as a researcher, and on professional preparation is sharpened. As we approach the 21st century, these changes serve as a working base for further progress.

Most spectacularly, interest in the elementary area has risen from third to first place among Alliance members. Specialists at the elementary level increased dramatically in the late 60s and early 70s due to increased school budgets, government funded projects, union negotiations which provided released time for classroom teachers, and an increasing understanding of learning and the young child.

To support new teachers' work, more textbooks began to emerge and new films were developed. As specialists entered the elementary area, they sought inservice conferences to explore curricula, class organization, and instructional procedures.

Prior to 1965, only two major invitational conferences had been held for elementary physical education, one in 1951 and another in the early 60s. Beginning in 1967, conferences at the national level—coupled with concentrated programs at the national convention—offered specific agendas to help move the profession forward: professional preparation, movement education, perceptual motor development, motor development of the young child, personalized learning, and theories for curriculum development.

New curricular thrusts have positively affected class organization and instruction. Movement education, as a lively thrust, placed more emphasis on the child, on foundations of movement, on success-oriented methods, on creativity, and on problem-solving. This approach to teaching led to lively debate. Today it is soundly accepted by some, rejected by others, and distorted by many. Nevertheless, it has moved teachers from classes characterized by long lines of children waiting turns and playing elimination games to classes characterized by maximum activity, ample equipment, individualized instruction, and challenging goals.

Concern by nonphysical educators for children with learning disabilities led to increased perceptual motor programs. From 1967 to 1972 the Perceptual-Motor Task Force planned a series of four conferences and four publications to question national practices and examine the scientific foundations of perceptual-motor behavior. This movement increased the credibility of physical education for children. As classroom teachers and parents saw children improve, programs became easier to justify.

Increasing interest in the child was also manifested in growing concern for personalized learning and individualized instruction. The interest in children with handicaps and low motor ability surged. Movement therapy emerged as an important way to treat children with psychological problems.

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More research in child growth and development, motor development, and motor learning began to appear. The 70s arts explosion led to a greater interest in creative dance as good physical education programs incorporated it as well as the folk forms.

A number of outside influences helped influence physical education for children. Early childhood associations, buttressed by more research on the young child, have readily supported new physical education curricula.

Government grants under the Elementary, Secondary Education Act for disadvantaged children, innovative programs, equipment and supplies, and state leadership were influential. More recently, the National Diffusion Network, an outgrowth of Title III funding for innovative programs, has been instrumental in networking. The Handicapped Act PL 94-142 and the Bureau for Educationally Handicapped have profoundly influenced elementary programs.

The international influences of movement education from England, the Anglo-American Workshops, the Binational Conference with Canada, and international travel to examine programs in England, Germany, and Scandinavia—and more recently the international meetings on dance for the child—have all had their effects.

A long, upward trail lies ahead. The schools are scathingly indicted for their failure to produce fit children. Yet how can one develop fitness, motor skills, or a life-long interest in the pursuit of physical activity if the class meets only one or two times a week for 20-30 minutes, has inadequate equipment with two and three classes meeting together, and a physical education specialist with 10-14 classes per day? Just as discouraging is the school system which leaves the classroom teacher solely responsible for physical education. We need to sensitize the public not only to the value of physical education for children but also to the characteristics of good programs.

Furthermore, our own professional preparation, though improved, sorely lags. Of the nearly 750 professional preparation institutions in this country, less than 200 offer more than one course specifically for the teaching of elementary physical education. That means over 500 institutions are not preparing majors for teaching physical education to children. Yet, these graduates, certified K-12 but steeped in sports, go out and teach watered down secondary programs or a simple series of games, relays, and exercise. This must be changed. There are a few bright spots where the K-12 certification looks at the study of movement skills and at teaching as a process. There are others with a sound elementary track within K-12 and others with a focus on K-6—even a thrust for K-6 certification in a few states.

Although physical education for children has gained stature in the past decade, issues remain. Hard questions require good answers. What really is/should be the *content* of elementary school physical education? How can we convince the public of the *need* for physical education? How do we help the public, the classroom teacher, the administrator to *identify good elementary physical education programs and qualified elementary physical education teachers*? What is the *role* of the classroom teacher? How do we *advocate* for budget and good programs? These questions need to be addressed at local, state, and national conventions and workshops.

As a profession, as professionals, it is our responsibility to examine and to build on the solid framework for elementary physical education which has emerged over the last decade.

Physical Education's Role in Public Health

James F. Sallis and Thomas L. McKenzie

The public health community is becoming increasingly interested in the potential contributions of school physical education to child health. School physical education is seen as an ideal site for the promotion of regular physical activity because up to 97% of elementary school children participate in some sort of physical education program. For maximal public health benefit, school physical education programs should prepare children for a lifetime of physical activity. This public health goal for physical education may require some changes in current approaches. Physical educators are challenged to collaborate with public health professionals in developing and evaluating school physical education programs that will improve the health of the nation's youth.

School physical education is an integral part of the American educational system. This is evidenced by findings that 97% of elementary school children are enrolled in physical education programs in grades 1 through 6, although only about 50% are enrolled by the end of high school (Ross, Dotson, Gilbert, & Katz, 1985; Ross, Pate, Corbin, Deply, & Gold, 1987). Historically, physical education has been justified on the basis of broad and diverse goals in physical, social, and moral development. In fact, the major emphasis has been on competitive sports, beginning as early as the third grade and continuing throughout high school (Ross et al., 1985, 1987). Until recently the large-scale fitness testing programs assessed sport-related skills rather than health-related fitness (Ross et al., 1987).

This sport-focused use of the resources devoted to physical education programs and interscholastic athletics is increasingly being questioned by health and physical education professionals. The American Academy of Physical Education (Malina, 1987), the American Academy of Pediatrics Committees on Sports Medicine and School Health (1987), and the American College of Sports Medicine (1988) have recently issued strongly worded statements highlighting the need for school physical education programs to adopt health-related physical activity goals. In a society in which adult sedentary behavior contributes substantially to the epidemic of cardiovascular and other chronic diseases, there is a rationale for shifting the orientation of physical education to a health focus. Moreover, school physical education is the only major institution that can address the health-related physical activity needs of virtually all children. The Year 2000 Health Objectives for the Nation (U.S. Public Health Service, 1991) includes a number of objectives for youth physical activ-

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ity and school physical education programs that will guide national policies for the 1990s. Physical educators should be involved in developing and implementing policies and programs derived from them.

In a recent review, Simons-Morton, O'Hara, Simons-Morton, and Parcel (1987) convincingly argued increasing children's physical activity is a more important public health goal than improving physical fitness. We accept Simons-Morton et al.'s conclusion that regular physical activity is important for children and proceed to consider how school physical education has a special role in promoting children's physical activity. This role is defined, and physical educators are challenged to join with public health professionals in developing and evaluating health-related physical education programs.

This paper analyzes the contributions physical education can make to the health of children and adults. Physical education has not historically been viewed as a public health program, but the reasons to consider it as such are compelling. In the past few years physical educators and health educators have begun to evaluate the effects of various physical education programs on health variabies (Simons-Morton, Parcel, O'Hara, Blair, & Pate, 1988). This work signals a paradigm shift with broad implications for the way physical education is viewed by health professionals, educators, and the public. In this paper we review the reasons for this paradigm shift, trace its progress to date, and recommend additional changes in the goals and methods of physical education derived from an application of public health principles.

Benefits of Physical Activity

The documented health benefits of physical activity for adults are fueling the drive for changes in school physical education (Simons-Morton, Parcel, O'Hara, Blair, & Pate, 1988). Physical inactivity is a major risk factor for cardiovascular diseases (CVD) (Berlin & Colditz, 1990; Powell, Thompson, Caspersen, & Kendrick, 1987) and promotes premature mortality (Paffenbarger, Hyde, Wing, & Hsieh, 1986). Even though epidemiologic data suggest adults could cut their risk of CVD in half by being regularly active (Berlin & Colditz, 1990; Powell et al., 1987), at least 40% of American adults are extremely sedentary (Casperson, Christenson, & Pollard, 1986; Stephens, Jacobs, & White, 1985). The hypothesis is improved physical education programs for children could help prevent the next generation of adults from becoming so sedentary. Because CVD kills more people in Western countries than any other disease, a reasonable but untested hypothesis about the benefits of physical education that could influence up to 97% of the population deserves serious consideration from researchers and policy makers.

One rationale for changing physical education programs is to establish patterns of regular activity in children that will carry over to adulthood. But regular physical activity can have health benefits in childhood as well. American children have high levels of obesity, serum cholesterol, and blood pressure. In studies of children in Iowa (Lauer, Connor, Leaverton, Reiter, & Clarke, 1975), Los Angeles (Wheeler, Marcus, Cullen, & Konugres, 1983), and New York City (Williams, Carter, Wynder, & Blumenfield, 1979), 28, 48, and 33% of children, respectively, had at least one elevated CVD risk factor. Numerous studies have indicated children who are more fit and more active tend to be leaner and have lower blood pressure levels (reviewed by Montoye, 1985). Physical activity is also associated with higher levels of beneficial HDL-cholesterol in children (Thorland & Gilliam, 1981). These associations between physical activity and risk factors are similar for adults and children (Sallis, Patterson, Buono, & Nader, 1988), so it appears children can reduce their risk for later heart disease through regular physical activity.

Because risk factor levels in childhood predict risk factor levels in young adulthood (Cresanta, Burke, Downey, Freedman, & Berenson, 1986), decreasing risk factors in children is an important health consideration in itself. Childhood obesity may be a particularly important risk factor in need of intervention. From 1963 to 1980 the prevalence of obesity increased 54% (defined by skinfold measurements, in 6- to 11-year-old children [Gortmaker, Dietz, Sobol, & Wehler, 1987]). Lack of physical activity probably contributed to this increase. Because physical activity effectively promotes long-term weight loss in obese children (Epstein, 1984) and adolescents (Becque, Katch, Rocchini, Marks, & Moorehead, 1988), increasing physical activity in children could play a role in preventing further increases in childhood obesity.

Other potential health benefits are more speculative. Physical activity in childhood and young adulthood is believed to enhance the uptake of calcium in the bones. High peak calcium content and slower loss of bone calcium are promoted by physical activity, so fractures during later life should be prevented (Chestnutt, 1990), and bone health throughout life should be improved (Smith, Smith, & Gilligan, 1990). Some scientists believe development and maintenance of muscular strength and flexibility will prevent back pain and other injuries in adulthood (Jopling, 1988). However, the strongest argument for a health-related physical education focus appears to be prevention of CVD.

CVD accounts for more than half of all deaths in the United States each year. If physical education programs can contribute to the prevention of this number one killer, existing physical education programs should be reoriented.

Current Levels of Physical Activity

Among professionals and the lay public there has been widespread concern about the fitness of American children. Yet children have substantially higher levels of cardiovascular fitness than adults (Simons-Morton et al., 1987), and there is insufficient evidence to conclude cardiovascular fitness levels have declined during the past few decades (Pate & Shephard, 1989). According to Simons-Morton et al. (1987) increasing cardiorespriatory fitness was not a health priority for children because health-related aspects of fitness do not seem to carry over to adult life. They recommended emphasis on the carryover of physical activity from childhood to adulthood. This recommendation has been echoed frequently (American Academy of Pediatrics Committees on Sports Medicine and School Health, 1987; American College of Sports Medicine, 1988; Ross et al., 1987).However, Simons-Morton et al. (1987) were criticized for their failure to consider all aspects of health-related fitness (Bar-Or, 1987; Corbin, 1987; Cureton, 1987; Seefeldt & Vogel, 1987). There is concern that physical education could become too focused on CVD prevention and neglect other important health benefits of physical activity. Even granting the importance of all fitness components and the deficiencies in knowledge of activity-CVD relationships, the primary health benefits from childhood physical activity will most likely come in preventing or delaying morbidity and mortality from CVD.

The data on the cardiovascular benefits of physical activity are much stronger than that on any other health benefits, which is the basis for the present focus on promoting primarily "heart healthy" physical activity through physical education. However, promoting heart healthy activities in physical education does not preclude improving other components of health-related fitness.

It is well accepted that physical activity has significant health benefits, but the levels of activity required in childhood to achieve these benefits are not understood at this time. For adults at least 20 min of vigorous exercize three times per week are needed to improve fitness. The same standard appears to apply for children (Simons-Morton et al., 1987). But improving fitness and decreasing health risk are two distinct goals. For adult men, over 2,000 calories per week in physical activity leads to important reductions in risk of death (Paffenbarger et al., 1986), but how this caloric expenditure standard would apply to children is unclear. In adults the dose-response relationship is such that moderate levels of physical activity confer substantial benefit in terms of preventing CVD and decreasing mortality (Leon, Connett, Jacobs, & Rauramaa, 1987; Paffenberger et al., 1986; Slattery, Jacobs, & Nichaman, 1989). The greatest health benefit appears to be gained when moving from sedentary to moderate levels of fitness or activity, and a diminishing benefit occurs when moving from moderate to vigorous levels of fitness or physical activity (Blair, Kohl et al., 1989; Paffenbarger et al., 1986). Less direct evidence of the effects of moderate physical activity on children is available, but activities such as walking are effective in the treatment of childhood obesity (Epstein, 1984). The majority of research and practice in physical education emphasizes vigorous activities that promote fitness, but even moderate intensity activities are likely to promote favorable health outcomes in children.

Investigators differ as to the adequqcy of children's levels of physical activity. Based on data regarding the minimum level of physical activity required for health benefits in adults, Blair, Clark, Cureton, and Powell (1989) applied these estimates to children. Children's self-reports of physical activity indicated 90% or more were active at the level required for health benefits. Based on a recommendation children should obtain moderate to vigorous physical activity on a daily basis (Haskell, Montoye, & Orenstein, 1985), Simons-Morton et al. (1990) found 35% of third and fourth grade students reported fewer than one episode per day of physical activity lasting at least 10 min. The most parsimonious conclusion at the present time is data on the level of physical activity needed for health benefits in children are insufficient.

Given the lack of criteria for desired levels of physical activity, it still may be instructive to determine how physically active children are. Several studies have assessed small numbers of children with objective measures such as direct observation and heart rate (HR) monitoring.

Preschool children are often considered particularly active, but free-play activity in young children has been reported in only two studies (see Table 1). In a U.S. preschool, 33 children were observed at recess (Sallis, Patterson, McKenzie, & Nader, 1988). Only 11% of time was spent in vigorous activities, although another 31% was spent in moderate intensity activities. A study of Czechoslovakian children in a day camp setting found boys spent 67% of their time and girls spent 60% of their time during an entire day with heart rates greater than 150% of resting values (Kucera, 1985). Although 60-67% of time in activity sounds like a large percentage, heart rate criterion was only about 120 b·min^{-1}, which can be achieved by young children at low intensities of physical activity. Given the small samples and limitations of methods, it must be concluded the level of activity of preschool children in unstructured situations is unknown.

Several studies have monitored school-age children over entire days (see Table 2). Three studies using heart rate monitoring produced somewhat similar results. Two of these reported the time spent at heart rates over 140 b·min^{-1} (Gilliam, Freedson, Geenen, & Shayraray, 1981; Sallis, Buono, Roby, Micale, & Nelson, 1991), which is approximately 70% of age-predicted VO_2max and corresponds to American College of Sports Medicine (1991) recommendations for intensity of conditioning activities. Gilliam et al. (1981) found 6–7-year-old children spent about 46 min at that heart rate (HR) level. Sallis et al. (1991) found similar levels in 10–12-year-olds, but time above HR > 140 dropped to 28 min in 13–17-year-olds. This finding was similar to the decrease in activity with age reported by Verschuur and Kemper (1985). They found 12–13-year-olds spent 30 min at HR > 150, with a decline to 15 min in 17–18-year-olds.

Thus, estimates of time school age children spend in moderate-to-vigorous intensity activity varied from 15 to 45 min per day. Although these results indicate most children are active and are meeting American College of Sports Medicine (1990) recommendations for adult activity levels, the HR data reported did not

Table 1. Objective measures of children's physical activity levels: preschool children

Study and Subjects	Methods	Results
Kucera (1985) *N* = 40; 4-year-olds	Monitored HR 8 a.m. to 6 p.m. day camp in unstructured activities	% of time with HR > 150% of baseline (mean HR = 160 b·min^{-1}) 67% for boys 60% for girls
Sallis et. al (1988) *N* = 33; 4-year-olds	Observed during 30-min unstructured recess at preschool	58% time in sedentary behavior 31% time in moderate activities 11% time in vigorous activity

Table 2. Objective measures of children's physical activity levels: school-age children

Study and subjects	Methods	Results
Hovell et al. (1978) *N* = 274; 3rd–6th graders	observed during unstructured recess at schools	Children were only two-thirds as active as adults who were observed performing conditioning activities.
Gilliam et al. (1981) *N* = 30; 6–7-year-olds	monitored HR 8 a.m. to 8 p.m. in summer	46.5 min with HR > 140 b·min^{-1}, 16.5 min with HR > 160 b·min^{-1}
Verschuur & Kemper (1985) *N* = not reported; 12–18-year-olds	monitored HR 24 hours on two school days	min with HR > 150 b·min^{-1}: 30 in 12–13-year-olds 15 in 17–18-year-olds
Baranowski et al. (1987) *N* = 24; 3rd–5th graders	observed for 12 hours each of two school days	10% of children had at least one bout of 20-min nonstop activity per day. 48% had at least one bout of 14-min activity with 0 or 1 stop per day.
Parcel et al. (1987) *N* = 48; 3rd and 4th graders	observed during unstructured recess at schools	Children were vigorously active only 6.9% of the time.
Sallis et al. (1991) *N* = 102; 5th, 8th, and 11th graders	monitored HR 8 a.m. to 8 p.m. on school days	minutes with HR > 140 b·min^{-1} 44 in 5th graders 28 in 8th graders 28 in 11th graders

consider the continuity of activity. Continuity is an important dimension of children's activity because children often display repeated bursts of activity rather than sustained movement. When "activity intervals" lasting at least 10 min were defined, the average boy and girl between the ages of 10 and 17 were found to spend 10–35 min per day in sustained moderate to vigorous activity (Sallis et al., 1991). Over a 12-hour day, this represents only 1.4 to 4.9% of time devoted to physical activity. These estimates should be interpreted in the context that activity levels appear to decline during the teen years (Rowland, 1990; Sallis et al., 1991; Verschuur & Kemper, 1985) and throughout adulthood (Stephens et al., 1985). There is little room for decline from 35 min per day. Although 2% of the day in physical activity is a small amount of time, this minimal level may be sufficient to provide important health benefits (Blair, Clark et al., 1989). This question will continue to be debated.

The question of whether children in the United States are too sedentary is controversial, but few disagree children could benefit from being more active. The next step is to consider what interventions can be devised to increase their physical activity levels. Any discussion of this topic must address the only institution currently responsible for promoting physical activity for all children: physical education in schools. Because children receive a majority of their physical activity outside of physical education (Ross & Gilbert, 1985; Ross & Pate, 1987; Simons-Morton et al., 1990), a comprehensive approach to promoting children's physical activity must go beyond the confines of the school campus. Because of its almost universal reach, the school will remain the centerpiece of youth-oriented physical activity programs. Youth sport and recreation programs provide valuable support to some children, but school physical education is required for all. Families must share the responsibility and religious organizations and other agencies may play a role, yet the promotion of children's physical activity is squarely in the purview of school physical education To limit the scope of the discussion and focus prevention efforts on young children, only elementary school physical education is considered in detail here. However, some points raised also apply to physical education in secondary schools.

Status of Elementary School Programs

Considering the large proportion of children involved in elementary physical education programs, it is essential to evaluate what these programs are doing to meet the health needs of children and how effective they are. In elementary school about 50% of the children have physical education three or more times per week, and the average child is scheduled to spend over 100 min per week in physical education class (Ross et al., 1985, 1987). Although half of elementary children take physical education at less than an acceptable frequency, the amount of time spent is considerable if children are at least moderately active most or all of their scheduled classes.

Assessing the quality as opposed to the quantity of elementary physical education is difficult, but one gross indicator is availability of trained physical education specialists. It is assumed trained physical educators are more effective than classroom teachers who have little or no training in physical education, and some data support this assumption (Faucette & Hillidge, 1989). The data on access to specialists are in conflict. The Natonal Children and Youth Fitness Study II (Ross et al., 1987) indicated specialists were conducting most elementary physical education lessons, but Randall (1986) suggested too few specialists were employed to make this possible. The National Children and Youth Fitness Study II asked elementary teachers how many physical education sessions per week were held with specialists and classroom teachers. Teachers reported 79% of physical education class meetings were led by a specialist.

Randall (1986) surveyed employment of physical education specialists. We calculated the student/specialist ratios for each reporting state. The number of states in each category are shown in Figure 1. We assumed a specialist teaching 10 class per day with 30 students each could handle about 500 students each week if classes were taught three days per week (i.e., 50 class sessions per week x 30 students per class = 1,500 student contacts; 3 contacts per week = 500 students per week). The average student/specialist ratio was 638:1 in elementary schools and 196:1 in secondary schools. Only 14 states reported ratios of 600:1 or less. Therefore less than 30% of states even approach adequate staffing for physical education specialists. Eight states had ratios of greater than 1,000:1, and 13 states did not report. California, the most populous state, did not report, but we estimate 85–95% of elementary physical education in this state is taught by classroom teachers.

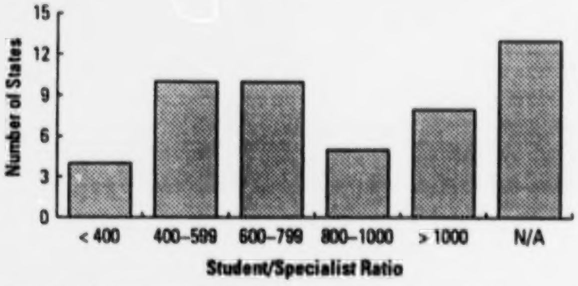


Figure 1. Student/specialist ratio in U.S. elementary schools.

A more definitive method of assessing the quality of physical education programs is to assess what occurs in class. Three sources of data are presented on this question. The five physical education activities most frequently reported by third through fifth grade teachers in National Children and Youth Fitness Studies I and II are shown in Table 3. If one considers lifetime activities as "those that may readily be carried into adulthood because they generally need only one or two people" (Ross et al., 1985, p. 76), then jumping rope, jogging, and calisthenics are the only lifetime activities on the list. However, the prominence of active sports such as soccer and basketball indicate teachers are attempting to keep children active.

When elementary physical education classes are directly observed, relatively little physical activity is seen. Parcel et al. (1987) observed physical education classes taught by specialists and coded the activity levels of children. They found in a 30-min class, the average child was vigorously active for only 2 min. Faucette, McKenzie, and Patterson (1990) observed 226 physical education classes taught by classroom teachers and categorized the time devoted to different kinds of activities. Most classes consisted of game play in which only a few children were active while the remainder waited their turn. Only 5% of the classes had fitness activities as the major focus.

The conclusions from this overview are (a) adequate time is not available for at least 50% of the children in elementary physical education, (b) during the scheduled time children are not very active and are not being prepared for lifetime physical activity, and (c) most classes are taught by those not trained in the subject matter. Objective measures regarding the quality of physical education present a less optimistic picture than teacher reports.

Review of Health-Related Physical Activity Interventions

Those who design health-related physical education programs should be familiar with the successes and failures of previous efforts to promote children's physical activity. Some school-based programs have involved physical education classes and some have not. Other programs have targeted the family as the agent of influence.

School-Based Programs

The need to improve the health-related functions of elementary physical education has been recognized for some time. While Cooper et al. (1975) first reported the effects of a jogging program on the fitness levels of high school students, numerous studies with elementary school students indicate physical education programs emphasizing cardiovascular fitness can be implemented. Some controlled studies of health-related physical education are shown in Table 4. Increases in activity at school were documented by self-report (Shephard et al., 1984), direct observation (Simons-Morton, Parcel, & O'Hara, 1988), and heart rate monitoring (Geenen, Gilliam, Crowley, Moorehead-Steffens, & Rosenthal, 1982; MacConnie, Gilliam, Geenen, & Pels, 1982). At least four studies found children who participated in health-related physical education improved their cardiovascular fitness (Duncan, Boyce, Itami, & Paffenbarger, 1983; Dwyer, Coonan, Leitch, Hetzel, & Baghurst, 1983; Maynard, Coonan, Worsley, Dwyer, & Baghurst, 1987; Siegel & Manfredi, 1984). Decreases in skinfold thicknesses in experimental groups have also been reported (Dwyer et al., 1983; Maynard et al., 1987).

Table 3. Most frequent physical education activities reported by teachers in the National Children and Youth Fitness Studies I and II

Rank	Grade 3	Grade 4	Grade 5
1	Soccer	Soccer	Calisthenics/ exercises
2	Movement experiences	Basketball	Jogging
3	Jumping rope	Gymnastics	Basketball
4	Gymnastics	Kickball	Kickball
5	Basketball	Jumping rope	Dodgeball

Note. Adapted from Ross et al., 1985, 1987.

Simons-Morton, Parcel, and O'Hara (1988) trained physical education specialists to implement health-related physical education. The amount of class time spent in fitness activities during the first year of intervention (40%) was twice the level of control schools (21%). This indicates experienced specialists can be trained to make substantial changes in their teaching practices.

When a health-related physical education curriculum is implemented by trained specialists, improvements in health-related outcomes can be expected. Even when more time is devoted to physical education, academic performance has been found not to suffer (Maynard et al., 1987; Shephard et al., 1984).

When school health promotion programs have targeted physical activity without directly influencing physical education classes, the results have been much less encouraging. Coates, Jeffery, and Slinkard (1981) reported the results of a diet and physical activity program designed to reduce CVD risk factors in fourth and fifth grade students. Behavioral self-management procedures were designed to help children identify and change health-related behaviors. The six-session physical activity component targeted increasing activity during the daily recess. There was no evidence the program had any effects on physical activity that were directly observed during recess, but there were significant intervention effects on dietary behavior.

Walter, Hofman, Vaughan, and Wynder (1988) described the five-year results of the "Know Your Body" comprehensive heart health promotion program that did not specifically target changes in physical education. The curriculum for fourth through eighth grade children focused on diet, physical activity, and cigarette smoking by trained classroom teachers. At the end of five years of intervention, there were significant changes in total cholesterol, dietary intake, and health knowledge, but no intervention effects on the measure of fitness.

Intensive health-related school physical education programs have been shown to improve children's levels of physical activity and decrease their CVD risk factors. However, behavior change programs without physical education components do not seem effective in increasing physical activity or fitness in elementary school students.

Table 4. School-based health-related elementary physical education studies

Study and subjects	Methods	Results
Shephard et al. (1980) *N* = 300, 10–12-year-olds	Intervention and control schools. 5 hours per week of endurance exercise	Intervention group reported more physical activity at school and out of school.
MacConnie et al. (1982) *N* = 59, 6–7-year-olds	Intervention and control schools. 4 sessions per week for 8 months. Variety of aerobic activities.	Higher heart rates during physical education and more time throughout the day at heart rates greater than 160 $b \cdot min^{-1}$.
Dwyer et al. (1983) Maynard et al (1987) *N* = 57, 10-year-olds	Usual PE, skill-oriented PE, or health-oriented PE. 75 min per week of aerobic activities.	Improvements in physical working capacity and decreases in skinfolds.
Duncan et al. (1983) *N* = 34, 5th graders	Intervention and control class. 90 min per week for 9 months. Variety of aerobic activities.	Improved mile run time from pre to post. Intervention–Control differences still significant at end of summer.
Siegel & Manfredi (1984) *N* = 169, 3rd graders	Intervention and control classes. 4 half-hour sessions per week. Calisthenics, running, and skill-oriented PE.	Improvements in run times.
Simons-Morton, Parcel, & O'Hara (1988) *N* = 1,250, 3rd and 4th graders	Intervention and control schools. Variety of aerobic activities plus sports and skills practice.	Increased time devoted to fitness activities and child activity during PE.

Note. Adapted from Simons-Morton, Parcel, O'Hara, Blair, & Pate, 1988.

Family-Based Programs

Family members influence each other's physical activity in many ways (Sallis & Nader, 1988), and the effectiveness of school-based programs may be improved by involving families in promoting their children's physical activity. There have been several attempts to promote childhood physical activity in which family involvement was a key factor. Nader and colleagues (Nader et al., 1983; 1989) conducted two studies in which families of fifth and sixth grade children were recruited through the schools. Adults and children worked together to modify their dietary and physical activity behaviors. Though intervention subjects improved blood pressure, dietary behaviors, and health knowledge, neither study showed an effect on the physical activity or fitness of adults or children.

Another family-oriented program with Black American families was also not successful in increasing physical activity (Baranowski et al., 1990). When a pediatrician attempted to begin an exercise program for healthy but inactive patients, most parents thought their children were active enough (Rowland, 1986). Of 24 inactive children targeted, most did not start the program and only 2 completed the four-month supervised regimen.

These different programs indicate important barriers to the success of family-based approaches to child physical activity promotion, but the nature of those barriers has yet to be identified. More effective methods of family involvement must be developed.

The most successful family-based program to date identified low-fit fourth through sixth grade children at school and solicited parental involvement in a home reinforcement program (Taggart, Taggart, & Siedentop, 1986). Twelve of 17 targeted families participated in the 12-week program. Parents worked with behavioral consultants who trained and assisted them in developing effective reinforcement programs to promote physical activity. Virtually all of the children increased both activity and fitness. The availability of appropriate facilities for activity and weekly contact with consultants were thought to enhance the program's effectiveness. However, this is more of a clinical than a public health approach to increasing physical activity, because an intensive individualized treatment was applied to a highly selected population.

The Epstein (1984) intervention for obese children has substantial similarities with the Taggart et al. (1986) program for low-fit children. The Epstein program involved devising behavioral contracts between parents and children, and this diet and exercise intervention produced weight losses that were maintained up to ten years (Epstein, Valoski, Wing, & McCurley;, 1990). The success of the Taggart et al. and Epstein programs suggests training parents in reinforcement techniques is an effective method. Methods for applying such principles on a broader basis need to be developed.

How family interventions could be integrated into school-based programs in unclear, but homework activities were effective in promoting changes in children's diets (Perry et al., 1988). Whether and how school physical education can incorporate family interventions remains to be seen, but this is a fruitful area for program development and research.

Public Health Analysis of Elementary Physical Education

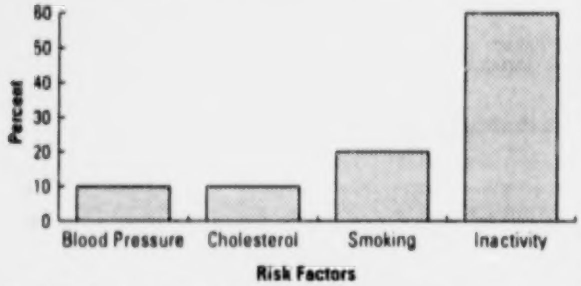
Health-Related Physical Education Should Be a High Priority

The goal of public health is to achieve the largest impact on the health status of the entire population. The concept ;of "population attributable risk" is useful in setting public health priorities. This refers to the excess number of deaths in the population that can be attributed to a particular cause. Population attributable risk is affected by the absolute risk of the disease, the strength of the risk factor (i.e., relative risk), and the prevalence of the risk factor. The data on physical activity and CVD in adults allow us to consider the population attributable risk for CVD related to physical inactivity. Because CVD causes more than half of all deaths in the United States, the absolute risk of the disease is high. Two comprehensive reviews of the association between physical activity and CVD mortality (Berlin & Colditz, 1990; Powell et al., 1987) concluded inactive adults are at least twice as likely to die of CVD as active adults. This relative risk of about 2.0 is approximately the same as the relative risk of the other major CVD risk factors: cigarette smoking, high blood pressure, and high serum cholesterol. Therefore, the relative risk of physical inactivity is high. As can be seen in Figure 2, the prevalence of inactive lifestyles is higher than that of any other risk factor (Centers for Disease Control, 1987).

This analysis suggests the population-attributable risk from physical inactivity is very high. Primarily because of the prevalence of inactive lifestyles, it appears more lives could be saved by changing physical activity habits of the population than by changing any other major CVD risk factor. Therefore, increasing the level of physical activity should be a major public health goal. If physical activity promotion in children can have effects that carry over into adulthood, then such programs should also be given a priority.

Physical education in schools is an ideal point of intervention because virtually all children participate.

Figure 2. Percentage of U.S. adults with CVD risk factors.



Note. Risk factors are defined as: Blood Pressure = systolic blood pressure > 150 mm Hg, Cholesterol = total cholesterol > 268 mg/dl, Smoking = smoke at least one pack of cigarettes per day, Inactivity = less than 20 min of physical activity three times per week.

Thus, an institution already exists that can potentially make large contributions to reducing the CVD epidemic in developed nations. The goals of public health regarding CVD prevention and the goals of physical eduation regarding the promotion of physical activity are similar and compatible. Few institutions in the United States can be so easily adapted to meet the important current and future health needs of the population.

Physical Education Should Prepare Children for an Active Adulthood

There is a major barrier to physical education contributing to the prevention of CVD. School physical education directly controls activity in class, but the most important outcome is increased physical activity in adulthood. There is no obvious, direct connection between the two, but the public health interest in physical education assumes a good foundation in physical activity in childhood will promote carryover to adulthood. Powell and Dysinger (1987) reviewed the literature on the association between physical activity in childhood or adolescence and activity patterns in adulthood. Their findings as well as those of four recent studies (Brill, Burkhalter, Kohl, Blair, & Goodyear, 1989; Dennison, Straus, Mellits, & Charney, 1988; Dishman, 1988; Sallis et al., 1989) are shown in Table 5.

Table 5. The association between physical activity or sports participation in youth and adult activity

Study and subjects	Method	Results
Montoye et al. (1959) 1,191 male Michigan State alumni	Cohort study	No association observed
Brunner (1969) 60 middle-aged professional males	Case-control study	No association observed
Harris (1970) Male Penn State employees	Case-control study	Observed association is likely confounded by education
Bucher (1974) 3,875 adults	Cross-sectional survey	Observed association is likely to be confounded by age and sex
Paffenbarger et al. (1984) 16,936 male Harvard alumni	Cohort study	Association is observed between activity in college and later life
Dennison et al. (1988) 453 males, 23–25 years old	Cohort study	Measured fitness at ages 10–11 and 15–18 predicted adult activity
Dishman (1988) 265 middle-aged white males	Cross-sectional survey	No association observed
Sallis et al. (1989) 2,053 males and females	Cross-sectional survey	No association observed
Brill et al. (1989) 345 former athletes and 75 nonathletes, male aged 25–60	Prospective study with retrospective reports of athletic history	Athletic history not related to physical fitness at baseline assessment or to exercise adoption rates over follow-up (mean of 56 months)

Note. Adapted from Powell & Dysinger, 1987.

The most parsimonious conclusion from these studies is the findings conflict. Because all of the studies have shortcomings, no one study can be considered definitive. The case could be made that all of the studies cited are irrelevant to the issue of the long-term effects of health-related physical education. That is because physical education and the other types of youth activities studied were typically oriented toward team sports. It is unclear why participation in team sports should predict involvement in adult activities that tend to be more solitary. Sallis et al. (1989) found those who were most active as children were not more active as adults but were more likely to watch sports on television (r = .38). This is a logical outcome for a sports-oriented physical education program. A sports-oriented physical education program may not influence adult activity levels, yet a health-oriented physical eduation program that teaches carryover activities would be more effective in preparing children for lifetime physical activity. From a public health perspective, this hypothesis needs to be studied because, if correct, the benefits of implementing such a program are great.

Moderate and Vigorous Intensity Activities

What types of physical activites should be recommended for children? Most of the emphasis on health-related youth fitness is on vigorous aerobic activities. However, if one is interested in establishing regular physical activity patterns that promote health rather than increase fitness, some evidence supports moderate-intensity activities as a particularly desirable intervention target (American College of Sports Medicine, 1991).

Apart from the health benefits reviewed above, moderate-intensity activities appear to be better maintained over time than vigorous activites, and they are more acceptable to those segments of the population that do not engage in vigorous activities. Adults who engage in moderate-intensity exercise are less likely to drop out over a one-year period than vigorous exercisers (Sallis et al., 1986). Vigorous exercise declines dramatically over the adult age range, but moderate-intensity activity is performed frequently at all ages, and women are as active as men in these activities (Hovell et al., 1990; Sallis et al., 1985).

Studies of obese children suggest moderate-intensity activities that can be incorporated into a daily lifestyle (e.g., walk to the store instead of riding in a car) are more effective at maintaining weight loss than vigorous exercise. Epstein, Wing, Koeske, Ossip, and Beck (1982) showed weight loss over a two-year period was superior in the group that did lifestyle exercise than in the group that did vigorous exercise. Only the lifestyle group maintained their fitness gains. These effects were replicated in a later study (Epstein, Wing, Koeske, & Valoski, 1985).

These studies suggest for long-term public health impact regular moderate-intensity activity may be a more appropriate goal than vigorous exercise. Moderate activities confer important health benefits, are appropriate for children and adults of all ages, and are more likely to be maintained. This recommendation is not meant to discourage children from engaging in vigorous exercise. The intent is to expand the range of activites to be considered health-promoting so children are given more options in developing a pattern of regular physical activity that meets their needs.

Wide Dissemination of Programs Is Needed

Effective and innovative programs must be practical if they are to impact a large proportion of the population. A good case in point is smoking prevention programs. Contemporary smoking prevention programs based on teaching adolescents to refuse offers of tobacco have been shown in most studies to be effective at reducing smoking initiation rates between 25 and 50% over one to three years (Flay, 1985). The superiority of such programs over the older fear-based programs has been known for over 10 years. However, relatively few school districts have adopted these effective psychosocial programs as part of their health curricula. Barriers to wide dissemination have not yet been addressed. Health-related physical education programs must be designed from the beginning with the end user in mind, in this case either a classroom teacher or physical education specialist. Not only must programs be practical, but once they are shown to be effective, they need to be disseminated to school districts.

Public health benefits from health-related physical education programs will be determined by (a) the effectiveness of the program in promoting long-term patterns of physical activity, and (b) the number of children who participate in the program. Health-related physical education programs should focus on maximizing the participation of all children, whether they are athletically gifted, clumsy, disinterested, or obese. Physical education in schools is the only preparation most children will have in how to develop an active lifestyle, so it is important to use physical education to increase motivation and teach relevant skills to all children to prepare them for lifetime physical activity.

To summarize, three main issues relevant to develping health-related elementary physical eduaction programs are suggested by consideration of public health principles.

1. Activities and skills taught to children should have the potential for carryover to adult life.

2. Moderate intensity activities should be an intervention target.

3. Potential for dissemination of health-related physical education programs to teachers and students throughout the nation should be considered.

A Public Health Role and Goal for Physical Education

Our challenge to physical educators is to adopt a new role and pursue a public health goal for school physical education. The new role for physical education professionals is to become a part of the team of public health professionals responsible for improving the health of the American people. School physical educators should collaborate with other public health professionals regarding program development and research. Professionals from a wide variety of disciplines have adopted a public health viewpoint without losing their professional identities. Dietitians are involved in improving the American diet. Psychologists are involved in developing effective methods of changing a variety of behaviors that influence health. Anthropologists are developing methods for improving the health practices of diverse cultural groups. School health educators are expanding their roles from teaching health facts to altering health behaviors. Exercise physiologists are identifying and promoting the proper types of physical activity for prevention, treatment, and rehabilitation of diseases. Physical educators, who have responsibility for teaching children physical activity skills, also have a great deal to contribute to public health. Defining physical education as a public health science, as well as a cognitive, social, and physiological science, serves to enhance the roles, influences, and opportunities for physical education profressionals.

The public health goal for physical education is to prepare children for a lifetime of regular physical activity. This is not a new goal. It has been proposed many times over the years (Corbin, 1986; Siedentop, 1980). The American College of Sports Medicine (1988) strongly endorses the goal of lifetime physical activity for school physical eduaction. The American Academy of Pediatrics Committees on Sports Medicine and School Health (1987) call for school physical educators to make a commitment to change physical education programs to maximize their impact on public health. Physical education should focus on promoting the development of a regular pattern of physical activity outside of class that has the potential to carry over into adulthood. School physical education designed to promote lifetime activity would likely emphasize generalizable movement skills useful for team sports in childhood and for more common adult activites later on. For example, throwing skills may be useful for baseball in youth and for volleyball and tennis in adulthood. Pacing skills during running could be applied during childhood and adulthood, and they could be generalized to cycling and cross-country skiing. The design of curricula to meet public health goals should become an active topic of theory, debate, and research in physical education.

Public-health oriented school physical education that prepares students for lifetime activity should teach activity planning skills as well as movement skills. Just because students enjoy physical activity and become skilled does not necessarily mean they will become more active outside of school. In modern America there are many barriers to regular physical activity, such as the lure of television and video games, the existence of unsafe neighborhoods, and lack of appropriate facilities. Childhood may not be too early to learn to systematically plan for physical activity, and physical activity planning skills are certainly relevant to the public health goal. A lifetime activity goal is a departure from the predominant current practice of physical education (Ross et al., 1985, 1987), but it is meant to expand, not replace, current goals. While influencing physical activity outside of class is not easy to achieve, if attained it will benefit millions of children by reducing their risks of several chronic diseases and improving their quality of life. If physical educators accept the challenge of this goal, several issues must be addressed.

The primary question concerns the implications of this goal for the content of physical education programs. How much will current practices have to be changed? Will other more traditional goals of physical education have to be abandoned, deemphasized, or modified? How much time should be devoted to improving each component of health-related fitness? If generalizable movement and activity planning skills are emphasized in physical education, will there be time for other activities? Will children become bored with fitness activities? What changes in the training of physical educators will be needed? It is inappropriate to try to answer these questions now because the research data are inadequate. These questions are just starting to be seriously debated, and empirical studies are required to provide data needed to guide important curriculum choices. At this time there are no clear-cut answers as to what an effective health-oriented physical education program would look like, especially one that attempts to influence children's physical activities outside of school.

Physical educators should debate these issues, develop model curricula, and most important, conduct rigorous research on the effects of health-oriented school physical education programs. Investigations of the immediate and long-term cognitive, social, behavioral, and physiological outcomes of health-oriented physical education programs are needed. Public health professionals are already beginning to study these issues. Physical educators should be, and are, involved in such studies, not only because these studies have important implications for the health of children, but also because they will help determine the future evolution of the field.

This paper has focused on the contribution elementary physical education can make to the health of children, but much of it applies to secondary physical education as well. Limiting attempts to promote lifetime physical activity to the elementary level will be effective only if movement and planning skills are refined and reinforced throughout the educational career of students. The importance of the commitment of secondary physical education to public health goals is suggested by survey data indicating the end of high school or college may be the time when physical activity is decreasing most rapidly (Stephens et al., 1985). Thus, high school and college physical educators may have the best opportunity to prepare students to maintain patterns of regular physical activity. The large number of physical education specialists in secondary schools (Randall, 1986) is an important resource. With training and curriculum changes they can be prepared to reorient their programs to a health-promoting approach to physical education. Secondary school students are better prepared developmentally to plan their own extracurricular programs than elementary school students, so more success in promoting out-of-school physical activity can be anticipated. A likely barrier to the reorientation of secondary teachers is the emphasis placed on competitive sports in physical education (Ross et al., 1985).

If physical educators do not accept the public health role and the goal of preparing children for a lifetime of physical activity, they will likely have diminishing influence over school physical education programs in the United States. The Public Health Service's (1991 Year 2000 Objectives for the Nation include several goals dealing directly with the quality and quantity of physical education. These objectives were developed by public health professionals with input from a few interested physical educators. The objectives were not systematically developed or promoted by any physical education organization. This is evidence physical educators are beginning to lose influence over important policy developments in their field. It is also evidence of increasing interest in school physical education on the part of public health professionals.

When physical education professionals and organizations develop programs and strategies to improve public health, then they will be a significant force in the development of health-related physical education programs for the nation's youth. If the public health role and goal are resisted, those in the physical education community may not only lose a valuable opportunity to positively influence the health of the nation, they may also lose some control over their own field. Given financial pressures and the return to educational "basics," support for physical education programs could be lost altogether (American Academy of Pediatrics Committees on Sports Medicine and School Health, 1987). The increasing interest of the public health community in physical education is a golden opportunity to improve the effectiveness, status, and possibly funding of school physical education. The opportunity should be seized, and a solid, lasting partnership between public health and physical education should be cemented.

References

American Academy of Pediatrics Committees on Sports Medicine and School Health, (1987). Physical fitness and the schools. *Pediatrics*, 80, 449-450.

American College of Sports Medicine. (1988). Physical fitness in children and youth. *Medicine and Science in Sports and Exercise*, 20, 422-423.

American College of Sports Medicine. (1990). The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness in healthy adults. *Medicine and Science in Sports and Exercise*, 22, 265-274.

American College of Sports Medicine. (1991). *Guidelines for exercise testing and prescription* (4th ed.). Philadelphia: Lea & Febiger.

Baranowski, T., Hooks, P., Tsong, Y., Cieslik, C., & Nader, P.R. (1987). Aerobic physical activity among third- to sixth-grade children. *Journal of Developmental and Behavioral Pediatrics*, 13, 203-206.

Baranowski, T., Simons-Morton, B., Hooks, P., Henske, J., Tiernan, K., Dunn, J.K., Burkhalter, H., Harper, J., & Palmer, J. (1990). A center-based program for exercise change among black-American families. *Health Education Quarterly*, 17, 179-186.

Bar-Or, O. (1987). A commentary on "Children and fitness: A public health perspective." *Research Quarterly for Exercise and Sport*, 58, 304-307.

Becque, M.D., Katch, V.L., Rocchini, A.P., Marks, C.R., & Moorehead, C. (1988). Coronary risk incidence of obese adolescents: Reduction by exercise plus diet intervention. *Pediatrics*, 81, 605-612,

Berlin, J.A., & Colditz, G.A. (1990). A meta-analysis of physical activity in the prevention of coronary heart disease. *American Journal of Epidemiology*, 132, 253-287.

Blair, S.N., Clark, D.G., Cureton, K.J., & Powell, K.E. (1989). Exercise and fitness in childhood: Implications for a lifetime of health. In C.V. Gisolfi & D.R. Lamb (Eds.), *Perspective in exercise science and sports medicine, vol. 2. Youth, exercise, and sport* (pp. 401-430). Indianapolis, IN: Benchmark.

Blair, S.N., Kohl, H.W., Paffenbarger, R.S., Clark, D.G., Cooper, K.H., & Gibbons, L.W. (1989). Physical fitness and all-cause mortality: A prospective study of healthy men and women. *Journal of the American Medical Association*, 262, 2395-2401.

Brill, P.A., Burkhalter, H.E., Kohl, H.W., Blair, S.N., & Goodyear, N.N. (1989). The impact of previous athleticism onexercise habits, physical fitness, and coronary heart disease risk factors in middle-aged men. *Research Quarterly for Exercise and Sport*, 60, 209-215.

Brunner, B.C. (1969). Personality and motivating factors influencing adult participation in vigorous physical activity. *Research Quarterly*, 40, 464-469.

Bucher, C.A. (1974). National adult physical fitness survey: Some implications. *Journal of Health, Physical Education, and Recreation*, 45(1), 25-28.

Caspersen, C.J., Christenson, G.M., & Pollanrd R.A. (1986). Status of the 1990 phyusical fitness and exercise objectives—evidence from NHIS 1985. *Public Health Reports*, 101, 587-592.

Centers for Disease Control. (1987). Protective effect of physical activity on coronary heart disease. *Morbidity and Mortality Weekly Report*, 36, 426-430.

Chestnutt, C.H. (1990). Is osteoporosis a pediatric disease? Peak bone mass attainment in the adolescent female. *Public Health Reports, Supplement*, 50-54.

Coates, T.J., Jeffery, R.W., & Slinkard, L.A. (1981). Heart healthy eating and exercise: Introducing and maintaining changes in health behaviors. *American Journal of Public Health*, 71, 15-23.

Cooper, K.H., Purdy, J.G., Friedman, A., Bohannon, R.L., Harris, R.A., & Arends, J.A. (1975). An aerobic conditioning program for the Fort Worth, Texas School District. *Research Quarterly*, 46, 345-350.

Corbin, C.B. (1986). Fitness in children: Developing lifetime fitness. *Journal of Physical Education, Recreation and Dance*, 57(5), 82-84.

Corbin, C.B. (1987). Youth fitness, exercise and health: There is much to be done. *Research Quarterly for Exercise and Sport*, 58, 303-314.

Cureton, K.J. (1987). Commentary on "Children and fitness: A public health perspective." *Research Quarterly for Exercise and Sport*, 58, 315-320.

Cresanta, J.L, Burke, G.L., Downey, A.M., Freedman, D.S., & Berenson, G.S. (1986). Prevention of atherosclerosis in childhood: Prevention in primary care. *Pediatric Clinics of North America*, 33, 835-858.

Dennison, B.A., Straus, J.H., Mellits, E.D., & Charney, E. (1988). Childhood physical fitness tests: Predictor of adult activity levels. *Pediatrics*, 82, 324-330.

Dishman, R.K. (1988). Supervised and free-living physical activity: No differences in former athletes and nonathletes. *American Journal of Preventive Medicine*, 4, 153-160.

Duncan, B., Boyce, W.T., Itami, R., & Paffenbarger, N. (1983). A controlled trial of a physical fitness program for fifth grade students. *Journal of School Health*, 53, 467-471.

Dwyer, T., Coonan, W.E., Leitch, D.R., Hetzel, B.S., & Baghurst, R.A. (1983). An investigation of the effects of daily physical activity on the health of primary school students in South Australia. *International Journal of Epidemiology*, 12, 308-312.

Epstein, L.H. (1984). Adherence to exercise in obese children. Journal of Cardiac Rehabilitation, 4, 185-195.

Epstein, L.H., Valoski, A., Wing, R.R., & McCurley, J. (1990). Ten-year follow-up of behavioral, family-based treatment for obese children. *Journal of the American Medical Association*, 264, 2519-2523.

Epstein, L.H., Wing, R.R., Koeske, R., Ossip, D., & Beck, S. (1982). A comparison of lifestyle change and programmed aerobic exercise on weight and fitness changes in obese children *Behavior Therapy*, 13, 651-665.

Epstein, L.H., Wing, R.R., Koeske, R., & Valoski, A. (1985). A comparison of lifestyle exercise, aerobic exercise, and calisthenics on weight loss in obese children. *Behavior Therapy*, 16, 345-356.

Faucette, F.N., & Hillidge, S.B. (1989). Research findings: PE specialists and classroom teachers. *Journal of Physical Education, Recreation and Dance*, 60(7), 51-54.

Faucette, N., McKenzie, T.L., & Patterson, P. (1990) Descriptive analysis of nonspecialist elementary physical education teachers' curricular choices and class organization. *Journal of Teaching in Physical Education*, 9, 284-293.

Flay, B.R. (1985). Psychosocial approaches to smoking prevention: A review of findings. *Health Psychology*, 4, 449-488.

Geenen, D.L., Gilliam, T.B., Crowley, D., Moorehead-Steffens, S.C., & Rosenthal, A. (1982). Echocardiographic measures in six to seven year-old children after an eight month exercise program. *American Journal of Cardiology*, 49, 1990-1995.

Gilliam, T.B., Freedson, P.S., Geenen, D.C., & Shahraray, B. (1981). Physical activity patterns determined by heart-rate monitoring in 6-7 year-old children. *Medicine and Science in Sports and Exercise*, 13, 65-67.

Gortmaker, S.L., Dietz, W.H., Sobol, A.N., & Wehler, C.A. (1987). Increasing pediatric obesity in the U.S. *American Journal of Diseases of Children*, 14, 535-540.

Harris, D.V. (1970). Physical activity history and attitudes of middle-aged men. *Medicine and Science in Sports*, 2, 203-208.

Haskell, W.L., Montoye, H.J., & Orenstein, D. (1985). Physical activity and exercise to achieve health-related physical fitness components. *Public Health Reports*, 100, 202-212.

Hovell, M.F., Bursick, J.H., Sharkey, R., & McClure, J. (1978). An evaluation of elementary students' voluntary physical activity during recess. *Research Quarterly*, 49, 460-474.

Hovell, M.F., Sallis, J.F., Hofstetter, C.R., Spry, V.M., Elder, J. P., & Caspersen, C.J. (1990). Identifying correlates of walking for exercise: An epidemiologic prerequesite for physical activity promotion. *Preventive Medicine*, 18, 856-866.

Jopling, R.J. (1988). Health-related fitness as preventive medicine. *Pediatrics in Review*, 10, 141-148.

Kucera, J. (1985). Spontaneous physical activity in preschool children. In R.A. Binkhorst, H.C.G. Kemper, & W.H.M. Saris

(Eds.), *Children and exercise XI* (pp. 175-182). Champaign, IL: Human Kinetics.

Lauer, R.M., Connor, W.E., Leaverton, P.E., Reiter, M.A., & Clarke, W.R. (1975). Coronary heart disease risk factors in school children: The Muscatine study. *Journal of Pediatrics*, 86, 697-706.

Leon, A.S., Connett, J., Jacobs, D.R., & Rauramaa, R. (1987). Leisure-time physical activity levels and risk of coronary heart disease and death: The Multiple Risk Factor Intervention Trial. *Journal of the American Medical Association*, 258, 2388-2395.

MacConnie, S.E., Gilliam, T.B., Geenen, D.L., & Pels, A.E. (1982). Daily physical activity patterns of prepubertal children involved in a vigorous exercise program. *International Journal of Sports Medicine*, 3, 202-207.

Malina, R.N. (1987). President's message. *The AAPE News*, 8, 1-2.

Maynard, E.J., Coonan, W.E., Worsley, A., Dwyer, T., & Baghurst, P.A. (1987). The development of the lifestyle education program in Australia. In B.S. Hetzel & G.S. Berenson (Eds.), *Cardiovascular risk factors in children: Epidemiology and prevention* (pp. 123-149). Amsterdam: Elsevier.

Montoye, H.J. (1985). Risk indicators for cardiovascular disease in relation to physical activity in youth. In R.A. Binkhorst, H.C.G. Kemper, & W.H.M. Saris (Eds.), *Children and exercise XI* (pp. 3-25). Champaign, IL: Human Kinetics.

Montoye, J.H., Van Huss, W., & Zuidema, M. (1959). Sports activities of athletes and nonathletes in later life. *Physical Educator*, 16, 48-51.

Nader, P.R., Baranowski, T., Vanderpool, N.A., Dunn, K., Dworkin, R., & Ray, L. (1983). The Family Health Project: Cardiovascular risk reduction education for children and parents. *Developmental and Behavioral Pediatrics*, 4, 3-10.

Nader, P.R., Sallis, J.F., Patterson, T.L., Abramson, I.S., Rupp, J.W., Senn, K.L., Atkins, C.J., Roppe, B.E., Morris, J.A., Wallace, J.P. & Vega, W.A. (1989). A family approach to cardiovascular risk reduction: Results from the San Diego Family Health Project. *Health Education Quarterly*, 16, 229-244.

Paffenbarger, R.S., Hyde, R.T., Wing, A.L., & Hsieh, C. (1986). Physical activity, all-cause mortality, and longevity of college alumni. *New England Journal of Medicine*, 314, 605-613.

Paffenbarger, R.S., Hyde, R.T., Wing, A.L., & Steinmetz, C.H. (1984). A natural history of athleticism and cardiovascular health, *Journal of the American Medical Association*, 252, 491-495.

Parcel, G.S., Simons-Morton, B.G., O'Hara, N.M., Baranowski, T., Kolbe, L.J., & Bee, D.E. (1987). School promotion of healthful diet and exercise behavior: An integration of organizational change and social learning theory interventions. *Journal of School Health*, 57, 150-156.

Pate, R.R., & Shephard, R.J. (1989). Characteristics of physical fitness in youth. In C.V. Gisolfi & D.R. Lamb (Eds.), *Perspectives in exercise science and sports medicine, vol. 2. Youth, exercise, and sport* (pp. 1-46). Indianapolis, IN: Benchmark.

Perry, C.L., Luepker, R.V., Murray, D.M., Kurth, C., Mullis, R., Crockett, S., & Jacobs, D.R. (1988). Parent involvement with children's health promotion: The Minnesota home team. *American Jurnal of Public Health*, 78, 1156-1160.

Powell, K.E., & Dysinger, W. (1987). Childhood participation in organized school sports and physical education as precursors of adult physical activity. *American Journal of Preventive Medicine*, 3, 276-281.

Powell, K.E., Thompson, P.D., Caspersen, C.J., & Kendrick, J.S. (1987). Physical activity and the incidence of coronary heart disease. *Annual Review of Public Health*, 8, 253-287.

Randall, L.E. (1986). Employment statistics: A national survey in public school physical education. *Journal of Physical Education, Recreation and Dance*, 57(1), 23-28.

Ross, J.G., Dotson, C.O., Gilbert, G.G., & Katz, S.J. (1985). What are kids doing in school physical education? *Journal of Physical Education, Recreation and Dance*, 56(1), 73-76.

Ross, J.G., & Gilbert, G.G. (1985). The National Children and Youth Fitness Study: A summary of findings, *Journal of Physical Education, Recreation and Dance*, 56(1), 45-50.

Ross, J.G., & Pate, R.R. (1987). The National Children and Youth Fitness Study II: A summary of findings. *Journal of Physical Education, Recreation and Dance*, 58(9), 51-56.

Ross, J.G., Pate, R.R., Corbin, C.B., Deply, L.A., & Gold, R.S. (1987). What is going on in the elementary physical education program? *Journal of Physical Education, Recreation and Dance*, 58(1), 78-84.

Rowland, T.W. (1986). Motivating factors in exercise training programs for children. *The Physician and Sportsmedicine*, 14(2), 122-128.

Rowland, T.W. (1990). *Exercise and children's health*. Champaign, IL: Human Kinetics.

Sallis, J.F., Buono, M.J., Roby, J.J., Micale, F.G., & Nelson, J.A. (1991). 7-day recall and other physical activity self-reports in children and adolescents. Manuscript submitted for publication.

Sallis, J.F., Haskell W.L., Fortmann, S.P., Vranizan, K.M., Taylor, C.G., & Solomon, D.S. (1986). Predictors of adoption and maintenance of physical activity in a community sample. *Preventive Medicine*, 15, 331-341.

Sallis, J.F., Haskell, W.L., Wood, P.D., Fortmann, S.P., Rogers, T., Blair, S.N., & Paffenbarger, R.S. (1985). Physical activity assessment methodology in the Five-City Project. *American Journal of Epidemiology*, 121, 91-106.

Sallis, J.F., Hovell, M.F., Hofstetter, C.R., Faucher, P., Elder, J.P., Blanchard, J., Caspersen, C.J., Powell, K.E., & Christenson, G.M. (1989). A multivariate study of exercise determinants in a community sample, *Preventive Medicine*, 18, 20-34.

Sallis, J.F., & Nader, P.R. (1988). Family determinants of health behavior. In D.S. Gochman (Ed.), *Health behavior: Emerging research perspectives* (pp. 107-124). New York: Plenum.

Sallis, J.F., Patterson, T.L., Buono, M.J., & Nader, P.R., (1988). Relation of cardiovascular fitness and physical activity to cardiovascular disease risk factors in children and adults. *American Journal of Epidemiology*, 127, 933-941.

Sallis, J.F., Patterson, T.L., McKenzie, T.L., & Nader, P.R. (1988) Family variables and physical activity in preschool children. *Journal of Developmental and Behavioral Pediatrics*, 9, 57-61.

Seefeldt, V., & Vogel, P. (1987). Children and fitness: A public health perspective: A response. *Research Quarterly for Exercise and Sport*, 58, 331-333.

Shephard, R.J., Jequier, J., Lavallee, H., La Barre, R., & Rajic, M. (1980). Habitual physical activity: Effects of sex, milieu, season, and required activity. *Journal of Sports Medicine*, 20, 55-66.

Shephard, R.J., Volle, M., Lavallee, H., La Barre, R., Jequier, J.C., & Rajic, M. (1984). Required physical activity and academic grades: A controlled study. In J. Ilmarinen (Ed.), *Proceedings of the 10th Pediatric Work Physiology Symposium*. Joutsa, Finland, 1981. Berlin: Springer-Verlag.

Siedentop, D. (1980). *Physical education: Introductory analysis* (3rd ed.) (pp. 44-59). Dubuque, IA: Little, Brown.

Siegel, J.A. & Mandred, T.G. (1984). Effects of a ten month fitness program on children. *The Physician and Sportsmedicine*, 12, 91-97.

Simons-Morton, B., O'Hara, N.M., Parcel, G.S., Huang, I.W., Baranowski, T., & Wilson, G. (1990). Children's frequency of participation in moderate to vigorous physical activities. *Research Quarterly for Exercise and Sport*, 61, 307-314.

Simons-Morton, B., O'Hara, N.M., Simons-Morton, D., & Parcel, G.S. (1987). Children and fitness: A public health perspective. *Research Quarterly for Exercise and Sport*, 58, 295-302.

Simons-Morton, B.G., Parcel, G.S., & O'Hara, N.M. (1988). Implementing organizational changes to promote healthful diet and physical activity at school. *Health Education Quarterly*, 15, 115-130.

Simons-Morton, B.G., Parcel, G.S., O'Hara, N.M., Blair, S.N., & Pate, R.R. (1988). Health related physical fitness in childhood: Status and recommendations. *Annual Review of Public Health*, 9, 403-425.

Slattery, M.L., Jacobs, D.R., & Nichaman, M.Z. (1989). Leisure-time physical activity and coronary heart disease death: The U.S. Railroad Study. *Circulation*, 79, 304-311.

Smith, E.L., Smith, K.A., & Gilligan, C. (1990). Exercise, fitness, osteoarthritis, and osteoporosis. In C. Bouchard, R. J. Shephard, T. Stephens, J.R. Sutton, & B.D. McPherson (Eds.), *Exercise, fitness, and health: A consensus of current knowledge* (pp. 517-528). Champaign, IL: Human Kinetics.

Stephens, T., Jacobs, D.R., & White, D.C. (1985). A descriptive epidemiology of leisure-time physical activity. *Public Health Reports*, 100, 147-158.

Taggart, A.C., Taggart, K., & Siedentop, D. (1986). Effects of a home-based activity program: A study with low-fitness elementary school children. *Behavior Modification*, 10, 487-507.

Thorland, W.G., & Gilliam, T.B. (1981). Comparison of serum lipids between habitually high and low active preadolescents. *Medicine and Science in Sports and Exercise*, 13, 316-321.

U.S. Public Health Service. (1991). *Healthy people 2000*. DHHS Pub. No. (PHS) 91-50212. Washington, DC: U.S. Government Printing Office.

Verschuur, R., & Kemper, H.C.G. (1985). The pattern of daily physical activity. *Medicine in Sport Sciences*, 20, 169-186.

Walter, H.J., Hofman, A., Vaughan, R.D., & Wynder, E.L. (1988). Modification of risk factors for coronary heart disease: Five-year results of a school-based intervention trial. *New England Journal of Medicine*, 318, 1093-1100.

Wheeler, R.C., Marcus, A.C., Cullen, J.W., & Konugres, E. (1983). Baseline chronic disease risk factors in a racially heterogeneous elementary school population: The "Know Your Body" program, Los Angeles. *Preventive Medicine*, 12, 569-587.

Williams, C.L., Carter, B.J., Wynder, E.L., & Blumenfield, T.A. (1979). Selected chronic disease "risk factors" in two elementary school populations: A pilot study. *American Journal of Diseases of Children*, 133, 704-708.

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What Is Going on in the Elementary Physical Education Program?

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What is the status of school physical education programs in grades 1 through 4? This article describes the resources that schools are investing in physical education at the early elementary level and examines the extent to which physical education programs are health related.

From a public health perspective, the school plays a pivotal role in influencing physical fitness and exercise habits of our children. Virtually every child attends school, especially in the elementary years. Physical education, school-sponsored extracurricular physical activity programs, and even monitored recess time could be expected to contribute to the child's fitness and exercise habits.

The 1980 government report, *Promoting Health/ Preventing Disease: Objectives for the Nation*, acknowledged the important role schools play in promoting active lifestyles. The report set specific objectives for participation of children in daily physical education programs and in periodic physical fitness testing.

The first National Children and Youth Fitness Study (NCYFS I 1985) described the status of physical education programs in grades 5 through 12. But what about younger children? Are most of them enrolled in a physical education class? What percentage take it daily? How much actual activity time do students get in physical education? How much time do they spend with a physical education specialist versus a classroom teacher? Do schools hold physical education classes in a suitable physical environment? What specific activities are offered most frequently in physical education class? Do schools periodically test the fitness of students? What do they test: health-related fitness or motor performance? Do most students receive some form of recognition for being tested? Are parents informed of fitness test results? How do school-sponsored extracurricular activities and daily recess time fit into the picture?

Survey questions on physical education

The following were among the data collected in NCYFS II from teachers of tested children: days per week children take physical education with a specialist; days per week with a classroom teacher; total days of physical education per week; certifications held by those who teach physical education; duration of the physical education class; actual time spent in physical activity; place in which physical education is held; five most frequent activities in physical education; types of fitness tests administered to students; percentage of students recognized for participation in fitness testing; whether fitness test results are reported to parents; opinions of teachers on why elementary school teachers do not do more fitness testing; types of school-sponsored sports teams or other extracurricular physical activity programs; and, finally, number and duration of recess periods in the typical school day. In addition, the enrollment status of each child in physical education was determined.

Physical education enrollment

Nationally, 97.0 percent of students in grades 1-4 are enrolled in a physical education program at school of some type or another (Exhibit 1). Enrollment rates are uniformly high, with virtually no differences among grades or between boys and girls. Such programs take various forms, ranging from highly structured programs to monitored free-play periods that are allowed to satisfy minimal physical education requirements.

Frequency of class meetings

Educators have stressed the importance of frequent physical education classes, and have strongly recommended daily meetings. One of the 1990 objectives for the nation is that 60 percent of students will participate in daily physical education. A point of concern for elementary schools is the belief that physical education classes are not held with adequate frequency. NCYFS I showed that only 36.3 percent of students in grades 5 through 12 take physical education daily (Ross & Gilbert, 1985). In fact, among first through fourth graders, the situation is virtually identical, with only 36.4 percent enrolled in daily physical education.

The average frequency of physical education for grades 1-4 is 3.1 times per week versus 3.6 weekly meetings for grades 5-12 (Ross & Gilbert, 1985). Only 15.3 percent of students in grades 1-4 take physical education one day a week and 21.9 percent take it two days a week. A narrow majority of students, or 50.5 percent, take physical education three or more days per week. An additional 4.9 percent take physical education two days one week and three days the next (in an A/B schedule); 4.4 percent take physical education with some other frequency (Exhibit 2).

Bi-modal distribution

There appears to be a bi-modal distribution in the frequency of physical education classes for students in grades 1-4. Those taking physical education only one or two days per week (37.2%) are balanced by those taking physical education daily (36.4%). Very few students

Exhibit 1. Percentage of U.S. Students Enrolled In Physical Education Based on NCYFS II

Grades	Boys	Girls
1	98.2	94.5
2	98.0	97.6
3	97.0	97.0
4	96.7	96.5
1-4	97.5	96.4

Exhibit 2. Percentage Breakdown by Grade: Days of Physical Education Based on NCYFS II

	Grades				
Days/Week	1	2	3	4	1-4
No Physical Education	3.5	2.2	3.0	3.4	3.0
1 day/week	14.9	14.5	17.3	14.7	15.3
2 days/week	22.3	22.6	23.7	18.7	21.9
2 days, one week; 3 days, the next	4.8	3.8	3.7	7.5	4.9
3 days/week	9.6	11.1	5.8	6.4	8.3
4 days/week	2.9	7.8	7.1	5.5	5.8
5 days/week	36.7	35.7	36.8	36.1	36.4
Other	5.4	2.2	2.4	7.7	4.4

take physical education with frequencies between these extremes.

The bi-modal distribution in grades 1-4 was also found in NCYFS I for grades 5 and 6, but not for older students. Instead, in grades 9-12, the bi-modal distribution is between students taking daily physical education and those *not even enrolled* (Ross & Gilbert, 1985).

While nearly all first through fourth graders are enrolled in physical education, the frequency with which their physical education classes meet is highly variable. It appears that a two-class system has evolved in physical education. The "haves" have physical education five days a week; the "have nots" have physical education only one or two days a week.

Physical activity time

The average physical education class meets for 33.4 minutes, with second graders having the shortest classes (32.0 minutes) and fourth graders the longest (35.4 minutes). In a week, the average student in grades 1-4 spends 102.9 minutes in physical education, with a spread of approximately nine minutes among the grades.

The actual amount of time that students spend in physical activity in the physical education class is difficult to estimate. Teachers reported spending only about 10 minutes per class on "housekeeping," getting students to and from class, and instruction. The remaining 24 minutes could be spent in some form of physical activity. Though this seems plausible on a group basis, it does not tell us what is happening with individual children during this time. Are they all engaged in fairly continuous exercise, or do they spend much of this time standing and watching? Research by Parcel and others (1987) suggests that the average elementary school student probably spends only two or three *minutes* in moderate to vigorous exercise in the average physical education class.

Teacher credentials

A second point of concern in elementary physical education is the belief that many students do not have the benefit of taking physical education with a qualified specialist. In fact, NCYFS II found that 83.1 percent of students in grades 1-4 take physical education at least one day a week with a specialist. Over three-quarters (76.0%) never see a classroom teacher for physical education. One in 10 take physical education from both a specialist and a classroom teacher.

Approximately 79 percent of physical education class meetings are spent with a specialist. Approximately 2.3 days per week are spent with a specialist versus 0.8 days with a classroom teacher. There is a tendency for students in grades 1 and 2 to spend slightly more physical education time with a classroom teacher than students in grades 3 and 4 (Exhibit 3).

Though children have specialists for physical education, do these specialists hold a proper certification in the field? NCYFS II indicates that many physical education specialists, perhaps as many as *one-third*, do not hold a valid certification in physical education. In addition, because certification requirements vary widely, it is not known what standards the two-thirds who are certified actually meet.

Place for physical education

A third point of concern is that, due to limited resources, many students may take physical education in physical surroundings that are unsuited to the purpose, such as an auditorium or regular classroom. In fact, according to NCYFS II, only 39.3 percent of first through fourth graders typically take physical education in a gymnasium. The school grounds (52.4%) are by far the most common place for physical education. Only 5.9 percent of students take physical education in a

Exhibit 3. Average Days Per Week With Physical Education Specialist vs Classroom Teacher, By Grade

Grade	Days with Specialist	Days with Classroom Teacher
1	2.1	0.9
2	2.4	0.9
3	2.3	0.8
4	2.3	0.7
1-4	2.3	0.8

cafeteria or multipurpose room, with 2.4 percent taking it in other places, such as an auditorium or a regular classroom. Students typically taking physical education on the school grounds have the benefit of *50 percent more class meetings per week* (3.6) than those not taking physical education on the school grounds (2.4). Use of a gymnasium for physical education remains fairly stable over the four grades.

It is interesting to speculate on why schools hold physical education on the school grounds rather than in a gymnasium. One hypothesis is that schools in temperate climates choose to hold physical education outdoors. In fact, 78 percent of students attending school in temperate climates typically take physical education on the school grounds, but only 31 percent of students in nontemperate climates do so.

A second hypothesis is that schools choose not to invest in resources such as specialists and gymnasiums. NCYFS II shows that students who typically take physical education in a gymnasium see a classroom teacher only 0.21 days per week, whereas those who take it outside a gymnasium see a classroom teacher 1.37 days per week. It appears that there is a tendency for some schools to invest in neither a specialist nor a gymnasium.

Predominant class activities

Teachers were asked to list the five physical education class activities which occupy the greatest amount of class time over the school year. Based on their answers, the rates to which children are exposed to a range of activities have been identified. Because only the top five activities were requested, the percent of children exposed to an activity is inevitably somewhat understated. However, the relative ranking of activities should not be affected.

Students in grades 1-4 are exposed to a core set of physical education class activities. The five activities with the highest exposure rates are movement experiences and body mechanics (43%), soccer (32%), jumping or skipping rope (26%), gymnastics (25%), and basketball (21%). In addition, between 15 and 20 percent of students are exposed to throwing and catching activities, calisthenics/exercises, rhythmic activities, kickball, relays, running, and baseball/softball.

Not surprisingly, the relative rates of exposure to specific activities in physical education class vary from one grade to another. Thus, coming up with a list of 10 top activities for each grade requires a list of 18 activities (Exhibit 4).

Exhibit 4. Rank & Percent Reporting Top 10 Most Frequent Physical Education Class Activities

	Grades							
	1		2		3		4	
Physical Activity	Rank	%	Rank	%	Rank	%	Rank	%
Baseball/Softball		*		*	7	.20	6	.20
Basketball		*		*	5	.25	2	.40
Calisthenics/Exercises	5	.22	8	.19	7	.20		*
Football		*		*		*	6	.20
Aerobic and Running Games	6	.21	4	.24		*		*
Low Organized Games	10	.17		*		*		*
Gymnastics	7	.20	3	.25	4	.26	3	.28
Jumping or Skipping Rope	4	.24	2	.28	2	.27	5	.23
Kickball		*		*	6	.21	4	.26
Locomotor Activities/Basic Skills	3	.26	6	.22		*		—
Movement Experiences/Body Mechanics	1	.42	1	.36	2	.27		*
Relays	10	.17	8	.19		*	8	.17
Racing/Sprinting	9	.18		*		*		*
Rhythmic Activities	7	.20	8	.19	9	.18		*
Soccer		*	7	.21	1	.43	1	.54
Throwing and Catching	2	.29	4	.24	10	.15		*
Track and Field (not running)		*		*		*	10	.14
Volleyball		*		*		*	9	.16

Activities marked with an asterisk (*) were performed, but did not enter the top 10 for a grade.
Activities marked with a dash (—) were not performed by a grade.

Certain activities maintain their position in the top 10 throughout grades 1-4. For example, calisthenics/exercises, gymnastics, jumping or skipping rope, relays, and rhythmic activities maintain a fairly constant exposure rate in the top 10 for at least three of the four grades.

Some activities decline while others rise sharply in exposure rates over the four years. The relative importance of low organized games, running/aerobic games, throwing and catching activities, and locomotor activities/basic skills declines as children grow older. In contrast, baseball/softball, basketball, football, kickball, soccer, volleyball, and track and field (not running) take on increasing importance from grade to grade.

The percentage of children exposed to specific physical education activities changes dramatically over the four grades. First, a set of activities called movement experiences/body mechanics holds the number one exposure rate in grades 1 (42%) and 2 (36%). In grade 3, it holds onto the number two position (27%) but, by grade 4, it does not even rank in the top 10. Second, basketball enters the top 10 for the first time in grade 3 with the number five ranking (25%) and, by grade 4, is ranked number 2 (40%). Third, soccer enters the top 10 in grade 2 with the number seven ranking (21%) but leaps to the number one ranking in grades 3 (43%) and 4 (54%). Thus, in grades 3 and 4, a sharp transition occurs, as physical education programs embrace competitive team sports.

It is entirely appropriate that, as children in the early elementary school grades develop greater attention spans, enhance their social skills, and mature physically, their likes and dislikes change along with their aptitudes. Therefore, physical education class offerings should change as well. Concern is justifiable, however, about the sharp transition as early as grade 3 toward competitive team sports. One of the key assumptions in the *Objectives for the Nation* related to physical education is that, "school based programs will embrace activities which expand beyond competitive sports." NCYFS II found that present school physical education programs in grades 5-12 are not geared to this goal (Ross & Gilbert, 1985). With the sharp transition toward competitive team sports, early elementary programs may also be moving in the wrong direction.

Fitness testing

Fitness testing serves several purposes including educating students about the various components of physical fitness, tracking changes in fitness levels over time, providing students, parents, and teachers with information concerning the fitness of children (including areas of need for fitness improvement), providing a basis for the development of personal exercise programs, and motivating students to improve their fitness levels and exercise habits. One of the 1990 objectives for the nation is that 70 percent of students will participate in periodic fitness testing.

An important finding of NCYFS II is that elementary schools have not adopted physical fitness testing programs on a broad basis and, when they have, their programs have not been health related. This finding comes as no particular surprise because norms for children under age 10 have been available only since 1980 (AAHPERD, 1980). However, the survey found that 49.7 percent of students in grades 1-4 attend schools that conduct some type of periodic fitness testing at their grade level. A much higher proportion of students in grades 3 (56.2%) and 4 (69.2%) are exposed to fitness testing programs than in grades 1 and 2 (37.7%).

As expected, the six most frequently used test items, all with exposure rates of 60 percent or higher, are the standing long jump, flexed-arm hang, pull-ups, sit-ups, dash, and shuttle run. All six items come from the old AAHPERD Youth Fitness Test (YFT), which is primarily a test of motor performance (Hunsicker & Reiff, 1976). Between 30 percent and 60 percent of students are exposed to a variety of other fitness tests, such as push-ups, chin-ups, softball throw, and 600-yard run. Test items more recently introduced in the AAHPERD Health Related Physical Fitness Test (HRPFT) and with lower exposure rates include a sit-and-reach test (26.7%), mile walk/run (17.6%), and skinfolds (8.7%). The most frequently used test item is the sit-up test, which is the one item included in both the YFT and HRPFT.

Why is there not more fitness testing in elementary schools? This question was posed to the teachers of students participating in NCYFS II. The most frequent explanations, in declining rank order, were as follows: "There isn't enough class time" (82%); "the classes are too big" (51.5%); "teachers don't know how to administer certain tests" (41.4%); "the mandated curriculum doesn't include testing" (38.1%); "the main interest is movement education, not fitness or sports skills" (34.5%); "teachers don't like the available tests" (24.4%); and "teachers don't like to encourage competition among the children" (21.8%). Few teachers said that testing posed an unacceptable risk of injury, children did not like being tested, the school did not allow it, testing was irrelevant in a nongraded program, or parents were opposed to testing.

Even more interesting are the differences in response patterns between teachers who test and those who do not. Teachers who do not test offered four reasons with significantly greater frequency than those who do ($p<.005$ in a two-tailed t-test). Nontesting teachers claim that there is not enough class time for testing, the classes are too big, many teachers do not know how to administer certain tests, and many teachers do not like the available tests. Two additional reasons were offered by nontesting teachers with significantly greater frequency ($p<.02$): risk of injury is too great and testing is irrelevant in a nongraded course.

Based on NCYFS II, one can see that the majority of children in grades 1-4 are not involved in a comprehensive, well-planned fitness testing program. Few programs test children for those aspects of physical fitness that are of widest concern to adults. In large part, this may be because teachers do not like the traditional tests of motor performance but are not familiar with or do not know how to administer newer fitness tests.

Reporting fitness test results

It is generally acknowledged that many children and youth are less fit than they might be. In the attempt to improve fitness levels, it has been suggested that students be rewarded for their fitness accomplishments. Such rewards, it is argued, will motivate them to try to improve their performance on fitness tests. NCYFS II indicates that reward systems vary widely and do not appear to be well thought out. Slightly less than one-half of students (49.5% in grades 1-4) who attend schools that conduct fitness testing programs receive recognition for test performance. Because less than one-half of all children have the opportunity to take fitness tests, somewhat less than one-quarter of children are rewarded. Less than one-quarter (23.2%) of students attend schools that test but recognize no one; 39.8 percent attend schools that test and recognize everyone. The proportion of students who are recognized seems to decline from grade to grade. However, this is primarily because schools typically recognize 100 percent of first and second graders. Excluding schools that recognize everyone, the recognition rate is fairly constant from grade to grade.

The principal method of reporting fitness test results to parents is the child's report card. The parents of three of five students attending schools that test fitness (about 29% of all children) receive some type of report of their child's fitness (grades 1-4).

Parents are interested in the health and fitness of their children, yet too few parents receive feedback of test results. If fitness is going to be improved among American youth, it can be argued that parents must aid in the process by encouraging out-of-school exercise. Fitness test results,if available, could provide parents with information which may stimulate them to encourage activity for their children. Further, it has been argued that rewards for fitness performances can motivate children to become involved in out-of-school activities. If this is true, a more systematic and well-thought-out system of rewarding children should be considered for our youth.

Recess time

Recess time provides a break to both students and teachers. Perhaps inappropriately, it is often viewed as a supplement to physical education. Therefore, it is important to know how much recess time children are receiving.

The average student in grades 1-4 receives 1.48 recesses in a day with the average recess lasting 18.32 minutes. The average daily recess time totals 30.1 minutes and is fairly constant across the four grades. The importance of recess time becomes clear when it is recalled that the average student takes only 3.1 physical education classes per week for approximately 35 minutes. Nearly as much time is spent in recess daily.

Based on NCYFS II, there is a strong *negative* relationship ($R = -.21$; $p<.001$) between daily recess time and weekly physical education time. This suggests that schools use recess to compensate for inadequate physical education programs. It also suggests that schools are typically willing to give just so much time to physical activity. Children who take a daily physical education class are thought not to need or be entitled to as much recess time. However, children need both structured time in physical education and discretionary time at recess. Recess can be presumed to contribute in important ways to the child's physical and mental well-being. Recess should not substitute for physical education nor should physical education substitute for recess.

Sports teams and extracurricular activities

Sports teams and extracurricular physical activities give students the opportunity for additional exercise, including the prospect of competition. If such programs encourage participation by students of widely varying skill levels, they can make an important contribution to the fitness of children.

Only 18.9 percent of students in grades 1-4 have the opportunity to participate in sports teams or extracurricular physical activities. The lowest opportunity is at grade 2 (10.2%) and the greatest opportunity comes in grade 4 (34.2%). The average number of different options in schools offering team sports and extracurricular physical activities is 1.72, ranging from a low of 1.2 in grade 2 to 2.17 in grade 4.

The most frequently offered sports and extracurricular physical activities, in declining rank order, are basketball, jumping or skipping rope, soccer, and games (unspecified). Tied for the fifth rank are baseball/softball, folk/square/ballroom dance, gymnastics, and track and field (not running).

Like the activities in physical education, extracurricular offerings also change from one grade to another (Exhibit 5). In grades 1 and 2, the top activities, in declining rank order, are jumping or skipping rope, rollerskating, games (unspecified), and soccer. Basketball enters the picture in grade 2 in a tie with soccer. Priorities begin to shift in grade 3, when basketball jumps from the number four rank (1%) to the number one position (7%), which it retains in grade 4 (19%). Jumping or skipping rope maintains the same approximate exposure rate during all four years, but declines in rank, as competitive sports are gradually introduced. Soccer, like basketball, rises from the number four rank in grades 1 and 2 to the number two slot in both grades 3 (4%) and 4 (11%). Gymnastics also enters the picture in grade 4, vying with jumping or skipping rope for the third rank (5%).

Summary and conclusions

Major questions to be answered in NCYFS II included: (1) HOW MUCH physical education do our children receive? (2) WHO teaches physical education? (3) WHERE are physical education classes conducted? and (4) WHAT actually goes on in physical education classes?

HOW MUCH physical education do our children receive? While it was expected that most students would receive physical education of some type in grades 1-4, it came as a pleasant surprise that the 97 percent enrolled in physical education attend class an average of 3.1 times weekly, with 36.4 percent attending classes daily. However, it appears that a two-class system has evolved at the early elementary school level. The "haves" take physical education daily; the "have nots" (37.2%) take physical education only one or two days per week.

It is also interesting that how much physical education a child receives is inversely related to the amount of recess received. Children need discretionary time just as they have a need for physical education instructional time. Recess periods may be used to supplement, but not substitute for, structured physical education. Nor should physical education time be allowed to replace recess time.

Evidence from this survey suggests that regular exercise can be increased among many children through an increase in extracurricular activities. More opportunities for those in the lower grade levels may be necessary.

WHO teaches physical education? The fact that a high proportion of physical education classes are taught by specialists (79%) was also a surprise. However, this finding alone distorts the picture because many spe-

Exhibit 5. Rank and Percent Reporting Top 5 Most Frequent Sports Teams and Extracurricular Physical Activities, By Grade

	Grades							
	1		2		3		4	
Physical Activity	Rank	%	Rank	%	Rank	%	Rank	%
Baseball/Softball		—		—		—	3	.05
Basketball		—	4	.01	1	.07	1	.19
Folk/Square/Ballroom Dance		—		—	4	.03		*
Games Unspecified	2	.02	2	.02	5	.02		*
Gymnastics		—		—		—	3	.05
Jumping or Skipping Rope	1	.06	1	.06	2	.04	3	.05
Rollerskating	2	.02	2	.02	5	.02		—
Soccer	4	.01	4	.01	2	.04	2	.11
Track and Field (not running)		—		—	5	.02		—

Activities marked with an asterisk (*) were performed, but did not enter the top 5 for a grade.

Activities marked with a dash (—) were not performed by a grade.

cialists, perhaps as many as one-third, do not hold valid certification in physical education. Further, there is some question as to the extensiveness of the qualifications of those who hold certification in physical education. There is cause for concern that some schools do not make the investment needed to hire a certified physical education specialist.

WHERE is physical education taught? In a majority of cases, it is *not* in a gymnasium. In more temperate climates, the outdoors may be the most suitable location for many activities. Still there is concern that more than a few schools not providing specialized physical education teachers appear to be also unwilling or unable to support adequate teaching facilities.

WHAT do children do in physical education? Results indicate that, from grade 1 to grade 4, a marked transition occurs in the activities conducted in physical education classes. The emphasis changes from movement education to fitness activities and sports skills. The dramatic shift toward team sports as early as grades 3 and 4 gives cause for concern. One of the key assumptions in *Objectives for the Nation* related to school physical education is that "school-based programs will embrace activities which expand beyond competitive sports." Both the results of NCYFS I and this study (NCYFS II), indicate that this important national goal is *not* being met.

There is little doubt that if the goals for the nation are to be met, action must be taken to improve the amount of time spent in physical education, to ensure that students are receiving instruction from qualified teachers, and to improve the facilities for these important educational programs. All of these are factors largely beyond the direct control of physical educators.

However, NCYFS II data do highlight several factors about which professional physical educators *can* do something. First, they can commit themselves to the *Objectives for the Nation*, which focus on health and fitness for all youth. Second, they can select activities which are appropriate for the age level of children and consistent with the stated health goals for the nation. Third, they can make efforts to design class experiences which make the most of the limited time now available for physical education. Finally, professional physical educators can adopt fitness testing programs which are consistent with developmental needs of students, promote lifetime exercise, motivate children to perform regular exercise, and keep parents aware of the fitness and exercise needs of their children. These efforts will make the most of the physical education experience and could promote active lifestyles beyond the boundaries of the school.

References

AAHPERD (1980). *Health related physical fitness test manual.* Reston, VA: AAHPERD.

Bar-Or, O. (1983). *Pediatric sports medicine for the practitioner.* New York: Springer-Verlag.

Hunsicker, P., & Reiff, G. (1976). *Youth fitness test manual.* Washington, DC: AAHPERD.

Parcel, G.S., Simons-Morton, B.G., O'Hara, N.M., Baranowski, T., Kolbe, L.J., & Bee, D.E. (1987). School promotion of healthful diet and exercise behavior: An integration of organizational change and social learning theory interventions. *Journal of School Health*, 57(4), 150-156.

Ross, J.G., & Gilbert, G.G. (1985). National children and youth fitness study: A summary of findings. *Journal of Physical Education, Recreation & Dance*, 56(1), 45-50.

U.S. Department of Health and Human Services. (1980). *Promoting health/preventing disease: Objectives for the nation.* Washington, DC: Government Printing Office.

Images of Quality for Elementary School Physical Education

Hubert A. Hoffman

Current calls for excellence in all areas of education have stimulated physical education professionals to define what they believe to be indicators of quality physical education programs for children. A natural response in identifying such quality indicators is to refer to available published documents such as position papers published by professional organizations (e.g., *Essentials of a Quality Elementary School Physical Education Program*, 1981, AAHPERD), or to consult audit criteria, demonstration school guidelines, or accreditation standards prepared by state departments of education. Other professionals would suggest that we should not place too much emphasis on such position papers and guidelines, but instead should look to the research literature to discover these quality indicators as they suggest that it is the research literature on effective teaching and effective schools which will identify the true indicators for quality programs of physical education for children.

My current work with teachers has led me to conclude that the answer to the question, "What are the indicators of quality physical education programs for children?" is indeed complex and elusive. I have found position papers, guidelines, and the research literature useful in my search for answers, but not sufficient to convince me that any list of indicators will define the conditions where quality programs exist.

Although I have found the search for indicators for quality programs elusive, I have developed some understanding of what I believe to be an important and critical element wherever I have found quality programs. I call this element an "image of quality" and I have found that it exists in a variety of school settings. This image of quality is defined by each teacher and is a personal inner standard of excellence. Often, one would have no reason to believe that a quality program would exist in a particular school. The equipment and facilities might be of poor quality, the principal might not support physical education, and the teacher might be encumbered with an unresponsive school system bureaucracy.But still, there is a quality program. At other schools one might find excellent facilities and equipment, a principal who understands and supports physical education, and a school system which supports teachers and their professional development needs. Although conditions appear to support a quality program, none exists—the element of an image of quality is not present.

I have found this image of quality present in many different programs. In each case, however, quality is defined in terms of student achievement of specified goals including the development of a predisposition to engage in physical activities. Therefore, the standard of quality can be applied to programs which have very different outcomes. Although many professionals do not agree on the goals of physical education programs for children, they can acknowledge when a program is successful in reaching its stated goals.

Thus, quality refers to the attainment of program goals and not to the goals themselves. This notion is supported by the observation of Siedentop (1987) when he stated that many good high school programs exist. He indicated that these programs stood for something very specific and had a main focus such as fitness, social development, sport, or adventure.

One important component of an image of quality is the teacher's program focus. The teachers I observe who have quality programs are the teachers who most clearly understand what they want their students to learn.

Recently, I have discovered that these teachers use some sort of a curriculum model as defined by Jewett and Bain (1985). They are clear about their own values regarding physical education for children and use some conceptual framework for designing their programs. Their programs are not isolated lessons or series of lessons, but rather well sequenced experiences

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designed to achieve specific outcomes. Because these teachers have a conceptual framework to guide short- and long-term planning, they demonstrate a sophistication in evaluating the potential of any activity in relation to their program goals. Most frequently, these teachers have used movement education models, developmental models, or fitness models in the development of their programs.

Rink (1982) described the efforts of one teacher who has an excellent program. This teacher indicated that the excellent lessons did not happen overnight and that the lessons reflected her beliefs and the intent of the program.

My own experience with teachers suggests that individual teachers develop their images of quality when they are clear about their own values and discover a conceptual framework to help them translate those values into programs. In several cases, teachers have confided that the discovery of a curriculum model has been the most significant event in giving meaning to their teaching. Frequently, the teachers have not studied curriculum theory and are not familiar with the concept of models. However, in discussing how they think about their work and what materials they use in planning, it becomes apparent that their program goals are clear and specific, and they use some conceptual framework for developing their programs.

Once developed, an image of quality becomes useful to practicing teachers in several ways. The most obvious is that teachers now have a conceptual way to think about their work. Physical education content, "new ideas," new equipment and supplies, and new teaching methods are now evaluated in terms of the teacher's basic values regarding physical education. Additionally, teachers find it easier to communicate to other teachers, administrators, parents, and their students the what and whys of their programs. In most cases, this new ability to communicate their image of quality has resulted in support for their programs.

As a result of knowing that their programs are congruent with their values, teachers with an image of quality appear to have a high sense of "teacher efficacy." Ashton (1984) defines this trait as a teacher's belief in his/her capacity to affect student performance.

Clearly, these are not the teachers who define their success in terms of keeping children "busy, happy and good" (Placek, 1983). These are teachers who are fun to be with. They demonstrate enthusiasm for their work, are willing to share their experiences (both successes and failures), and constantly seek new information. They talk about what their kids are learning and what they are learning from their kids.

Reviews of research on teacher effectiveness such as Harrison's (1987) and various documents prepared by professional associations and educational agencies provide varied indicators of quality physical education programs for children. What is not known, however, is to what degree any teacher trait, skill, or behavior or any condition (such as an effective principal) must be present for quality programs to exist.

Certainly we must strive to improve the conditions for effective professional practice. Certainly we must strive to improve programs for teacher development, both pre- and in-service. But we must also strive to develop the images of quality which appear to be central to how teachers do their work in providing quality programs for children's physical education.

References

Ashton, P. (1984). Teacher efficacy: A motivational paradigm for effective teacher education. *Journal of Teacher Education*, 35(5), 28-32.

Harrison, J. (1987). A review of the research on teacher effectiveness and its implications for current practice. *Quest*, 39(1), 36-55.

Jewett, A., & Bain, L. (1985). *The curriculum process in physical education*. Dubuque, IA: Wm. C. Brown.

Placek, J. (1983). Conceptions of success in teaching: Busy, happy and good. In T.J. Templin & J.K. Olson (Eds.), *Teaching in physical education* (pp. 46-56). Champaign, IL: Human Kinetics.

Rink, J. (1982) The key is the learning environment. *Journal of Physical Education, Recreation and Dance*, 53(7), 44-45.

Siedentop, D. (1987). High school physical education: Still an endangered species. *Journal of Physical Education, Recreation and Dance*, 58(2), 24-25.

Movement Education: From Cliché to Myth to Meaning

Pamela C. Allison
Kim Collins

Professionals who have used the clichés of movement education have made of it a myth — imaginary, unverifiable, uncriticized.

When a term has become sufficiently familiar and widely used to enter our daily professional discourse, something more than mere dialogue takes place. The symbol system of language is used to describe and explain the term. Description and explanation, however, require two distinctly different languages, both being necessary for complete communication.[1] Without explanation, description conveys the idea that no further explanation is necessary. Thus, the descriptive language becomes the "truths" about the term. As the term is communicated, so are the "truths."

"Truths" are not supposed to be challenged or questioned. They are to be accepted and used as a basis for plans and actions. If the term happens to be in the area of curriculum, the "truths" about the term are used as a basis for curricular plans and actions. Movement education is such a term. The term has been so widely used in the professional literature, at professional meetings, and in educational institutions that it has become familiar, popular, and desirable.[2] Some professionals have not realized the need for description *and* explanation in movement education dialogue. For whatever reason, some professionals dissolve terms, first into cliché, and then into myth.

Clichés of Movement Education

Belth has suggested that terms are dissolved into clichés because of (a) certainty, (b) exhaustion, and/or (c) innocent acceptance of the root of so-called "truths" about the term. Movement education seems to be have followed this path of dissolution. (See note at end of this article.)

Certainty. Clichés, spoken from a position of certainty, are used because the speakers are positive they know the meaning of the statements, but are unaware that they are conveying imprecise meanings. Two clichés illustrate this point. Some movement educators say that "movement education is content" and "the content of movement education is time, weight, and space." These professionals are trying to convey with their *time*, *weight*, and *space* language that movement education uses Laban's conceptualization of movement.[3] Yet they

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demonstrate an incomplete conceptualization of his framework. Laban's conceptualization of movement is organized around body, space, effort, and relationship themes. Time and weight are part of an explanation of the effort aspect and space could refer to space quality as part of effort or space quantity as part of the aspect of spatial awareness.

Even if these movement educators are trying to convey, with their *time*, *weight*, and *space* language, an explanation of Laban's effort aspect of movement, they demonstrate an incomplete conceptualization. Flow is the most important component of effort, the perfect harmony of all the motion factors. Therefore, time, weight, space, *and* flow provide a more complete explanation of effort. Movement educators who have not really examined Laban's work believe that time, weight, and space accurately describe his conceptualization of movement or the effort aspect of movement. In so doing, they perpetuate two clichés.

Exhaustion. Exhaustion can also prompt the use of cliches. Movement educators, having become tired of being questioned about their descriptive dialogue, may use clichés hoping everyone understands what is meant. The cliché that "movement education calls for more broad and varied experiences" raises the question "more broad and varied than what?" and "experiences of what nature?"

Innocent acceptance. The innocent acceptance of "truths" also dissolves terms into clichés. Some movement educators assume that when other professionals use the same clichés, they speak the same "truth." Unquestioned use of cliches results in the use of words without internalizing the meanings. Thus the "truth" is innocently accepted. If everyone uses the cliché, "movement education is process," it needs to be neither explained nor understood. Everyone appears to understand the process of movement education because everyone says movement education is process.

Accepting this line of thought, there is no reason to question whether movement education has a product. Or, if it does have a product, is the process more important? Or, are product and process equally important? Just what is the *process* of movement education? How is this process explained? Without questioning, there is no examination, and no growth toward meaning and understanding.

The Myth of Movement Education

As the clichés of movement education came to be known to more and more professionals through workshops, conventions, demonstration lessons, and the literature, movement education came to have a mythical existence. A myth has an imaginary unverifiable existence; it is a set of uncritically held beliefs. Professionals who have used the clichés of movement education without internalizing their meanings have created an imaginary and unverifiable existence for it. Their uncritically held beliefs constitute a dangerous and vulnerable professional position.

These three characteristics of a myth are particularly evident in the outcomes, characteristics, and methodology of movement education. They constitute its danger areas.

Imaginary. The outcomes of movement education could appear imaginary because some professionals seem unable to explain the clichés used to describe the outcomes. An often cited outcome is an "efficient and effective move." Pressed for an explanation of such a person or a definition of *efficiency* and *effectiveness*, the movement educator cannot continue the dialogue. The explanations that efficiency implies an economy of movement and that effectiveness implies goal attainment are not offered.

The notion of versatility is also important, as it implies moving with ease in both planned and unplanned movement situations and not in stereotypic, predetermined patterns.[4] It is not crucial that these outcomes be the goals of every movement education program, but that professionals must be able to explain, not simply describe, their outcomes.

Unverifiable. Movement education has an unverifiable existence for some because descriptions of movement education programs are inconsistent with their actual implementation. Child-centeredness is a frequently named program characteristic. Described with such varied terminology as humanistic, unthreatening, personalized, and individualized, these ideas suggest a gymnasium where each child's learning rate and style are honored and where opportunities are provided for maximum student decision-making and participation. These ideas are not visible in many movement education classes. One sees each child performing the same movement, with the same type of equipment at the same time with the same body parts. In short, descriptive words and actions are inconsistent.

Uncriticized. The "myth" of movement education is based on uncriticized beliefs. The cliché "movement education is problem-solving" implies only one method of movement education. This cliché cannot withstand critical examination for reasons of consistency. If a characteristic of movement education is child-centeredness, then the use of one method contradicts this concept of personalization and individualization.

Meaning for Movement Education

Movement education, having dissolved into clichés, has deteriorated into a "myth" because of the inability of movement educators to explain meaning, the inconsistency between stated and realized program implementation, and the uncriticized beliefs on which it is based. To demythologize movement education, future discourse must be both descriptive *and* explanatory.

Explanatory dialogue is necessary because nothing "is so complete and evident in and of itself, that by describing it, we can give a complete account of it. In the changes that occur we need sometimes to understand origins we could never observe, or possibilities we must guard against or encourage so that they will or will not in fact occur."[5]

To many professionals, movement education has appeared to be evident in and of itself. If professionals will examine the origins of movement education and project possibilities that should be encouraged or discouraged, then they will be closer to a more complete understanding of it. The descriptive dialogue of movement education appears plentiful, but the explanatory dialogue about it is less so, though currently available from some movement educators.[6] With critical study, and careful philosophical analysis, perhaps movement education can progress from myth to meaning for all movement educators.

Endnotes

1. Belth, M. *The process of thinking*. New York: McKay, 1977.
2. Barrett, K.R. Movement education and elementary school physical education: 1950-1980, the years of doubt. Paper presented at American Alliance for Health, Physical Education, Recreation and Dance National Convention, Detroit, April 1980.
3. Laban, R. *Modern educational dance*. London: MacDonald & Evans, 1975.
4. Logsdon, B.J. Physical education—a design for direction. In *Physical education for children, A focus on the teaching process*. Philadelphia: Lea & Febiger, 1977.
5. Belth, pp. 38-39.
6. Riley, M.I. Games and humanism. *Journal of Physical Education, Recreation and Dance*, 1975, 46(2), 47-49. Also Barrett, op. cit. and Logsdon, op. cit.

Note: The source for the ideas presented in this paper is the information collected at the Elementary and Middle School Physical Education Conference sponsored by Georgia State University, Atlanta, Georgia, January 15-17, 1981. Particularly, the information was garnered from a content analysis of written answers to questions discussed at the session "Movement Education: Direction or Demise?" by Kate R. Barrett, University of North Carolina-Greensboro. For additional information consult the summary of this session by Barrett, K.R., Allison, P.C., and Collins, K.A. in the *Contemporary Elementary and Middle School Physical Education Conference Proceedings*, Margaret A. Jones (Ed.), 1981.

Foundations for Elementary School Physical Education

Each of the articles included in this section illustrates the importance of sound foundational knowledge in developing appropriate movement experiences for children. Each uses examples or provides implications for teachers in organizing the learning environment.

Motor Development and Physical Education for Young Children

Lolas E. Halverson

This article appeared in the report of the 1988 Early Childhood Conference, "Forging the Linkage Between Moving and Learning for Preschool Children," titled *Moving and Learning for the Young Child*, William J. Stinson, Ed., published by AAHPERD.

Introduction

In 1971, a conference titled "The Significance of the Young Child's Motor Development" was jointly sponsored by the American Association for Health, Physical Education, and Recreation and the National Association for the Education of Young Children. The 1971 conference observer and summarizer, Keturah Whitehurst, in her closing statement, said that to the young child, movement is an important factor in self discovery; movement means discovery of the environment; movement facilitates the development of the child's concepts of time, space, and direction; movement means freedom; movement means safety; movement is an important ingredient in communication; movement is sheer enjoyment and sensuous pleasure; movement means acceptance. Dr. Whitehurst concluded by saying: "If movement means so much to the developing child, no further justification should be required for its inclusion among the major techniques in education" (Whitehurst, 1971, p. 55).

This was a great affirmation of the need for physical education in the education of young children. There seemed no doubt that those of us attending the 1971 conference believed these words of Dr. Whitehurst as we left that final session. Yet, apparently something happened on the path from that conference to this 1988 conference. Why, if we had believed and had acted on Dr. Whitehurst's summary comments, do we now have a focus in this session, "Physical Education, The Forgotten Aspect of Early Childhood Education"?

To briefly explore possible reasons for this question, it is important to return for a moment to the focus of the 1971 conference — the question of whether motor development was significant in the lives of young children and, if so, what this meant for physical education programs in early childhood.

Even before the 1971 conference, to me it was a "given" that developmental progress in movement control was significant in the child's overall development. To me it was also a "given" that motor development research was essential to the understanding of this developmental progress in movement control. It seemed obvious that all of this was necessary if we were to design meaningful and developmentally appropriate movement programs for young children. Apparently many of us at the end of the 1971 conference assumed that these beliefs were also "givens" for all conferees, and would magically be embraced by all physical and early childhood educators. We seemed to assume that just as magically these "given" beliefs would be put into action in early childhood programs.

Of course, it was not realistic to make such assumptions. For such assumptions to become reality: (1) beliefs about programs of physical education for young children had to be compatible with the developmental needs of the children; (2) motor development research had to grow in quantity and quality and such research had to be meaningfully communicated to the teachers and parents of young children; and (3) physical and

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early childhood educators had to have adequate pre- and in-service experience in quality movement programs for young children in preparation for developing such programs in their own schools.

While many of these requisites for progress in provision of developmentally appropriate physical education programs for young children were in action in a few schools and teacher preparation programs by 1971, there was much to be done before our assumptions could become dominant in action, Unfortunately, while considerable progress has been made since 1971, we are still far from realizing our hopes. I would like to explore possible reasons why this is so by looking at the three points I have just cited.

Physical Education and the Developmental Needs of Children

First, beliefs about programs of physical education had to be compatible with the developmental needs of children. This suggests that programs had to be centered on the child, not on the activities to be taught. They had to be developmentally sound.

In reflecting on my own beliefs as I approached the 1971 conference, I became aware that my accepted "givens" in the 1970s had not always been clear to me. I had to run up against a personal "developmental" barrier, and having run up against this barrier, I then had to care to make a switch in my orientation in physical education before these "givens" could fall into place.

The young child's development, especially motor development, has been an interest of mine throughout most of my career. Trying to better observe and describe the actual movement patterns of the child; to understand how these movement patterns change over time and why they change; to study the underlying processes which may explain the movement pattern changes has long been at the center of my work. In addition, I have been interested in applying motor development research knowledge in the development of quality physical education experiences for young children. But asking and seeking answers to such questions and challenges was not really where I started.

In the late 1950s and early 1960s, I looked back on several years of teaching "gym" to preschool and elementary aged children, and on attempts to teach physical education majors how to teach physical education to the young child. I had even moved out into the realm of conducting workshops for inservice teachers. Even though I was recognized as a successful physical education teacher, a growing and rather awesome realization began to catch up with me. I really did not know very much at all about the phenomenon of the development of movement in the human being. I really did not know very much about what the child hopping, skipping, galloping, jumping, throwing, or catching really looked like in any detail.

I knew almost nothing about how these movements changed developmentally. I began to think that if I did not really know these things, I could not hope to observe children's movement and know where to start to help them become better movers. How did I know when they were ready for more complex movement challenges? I knew very little about how children felt about themselves as movers; about how they felt as they moved; about what they thought about the movement experiences I had designed for them. A host of other "If I do not know, how can I?" questions crowded into my mind.

I suspect most of you cannot go back in memory with me to the physical education program patterns that dominated the 1940s and 50s but let me sketch a bit of this for you.

I knew a lot about games, dances, stunts, tumbling, and individual and dual activities. I knew the rules and strategies for a fair number of team sports. I knew a little about anatomy, physiology, and something called kinesiology, then more like applied anatomy than the current study of the dynamics of human motion. I knew a little bit about psychology and teaching methodology. I knew how to develop efficient squad formations, select squad leaders, take roll, and select equipment. I knew how to organize lists of games, dances, individual activities, etc., into 3, 4, or 5 week curriculum blocks, being careful to achieve a yearly balance among the needed categories of activities. I knew how to measure outcome or result information, such as how fast the child could run, how many feet the child could jump, or how many games the child could name.

I had books that listed "faults" in the performance of particular movement skills required for playing the games, dances, and individualized activities I selected for the children. These faults were based on skill demands for success in the activity, usually using adult skilled performance as a model. They were not based on developmental readiness for meeting the demands of the skill.

As I reached my own developmental barrier as a teacher, I began to realize that such background had prepared me to teach activities, not children. If I really were teaching children, what was I doing centering my attention primarily on the activity to be taught rather than on the moving child? If I really wanted to contribute to the education of the child, what was I doing trying to fit all of the children I taught to the activities I chose, rather than observing the moving child and designing movement activities to fit the child's needs? How did I really know where a child was in developmental readiness to cope with activities I asked them to learn?

These were unsettling questions to say the least. I had a lot to ponder, a great deal to learn. I had substantial changes to make both in the physical education programs I designed for children, and in the methodology I used in working with children within these programs.

After four years as an undergraduate, and through several years of teaching, I had finally discovered the child as the center of my concern. The difficult question facing me then was how I could effectively change directions from activity-dominated programs that required the child to adjust to the development of the activity, to child-centered programs in which activities were designed to meet needs of the developing child.

That I made the change has been evident in my writing and teaching (Halverson, 1966, 1971a, 1971b; Roberton & Halverson, 1984). That many others made that change also, or were fortunate to be taught by physical educators who had already made this shift, is evident in their writing. The following is only a small "starter" sample of physical education for children references you may wish to consult for more information: Barrett, 1973; Gallahue, 1982; Graham, Holt/Hale & Parker, 1987; Logsdon, 1983; Riley, Barrett, Martinek, and Roberton, 1980. (Throughout this paper, suggested "starter" reference lists are not meant to be comprehensive. In most instances there are also other good references available.)

That we have so many fine references is good news, and evidence of important progress made since 1971. That the prevailing pattern of physical education programs illustrated by my 1940s background is, however, still dominant in some form in the 1980s is, in my opinion, bad news. The reason for the continued popularity of the activity-centered adult modeled programs of the 1950s is hard for me to understand.

I suspect that a good deal of the reason why this can be true may be traced to the current culture with its stress on competitive sports; on the "we have to be number one" syndrome; on viewing fitness programs as synonymous with physical education, rather than a possible outcome of aspects of physical education programs; and on the assumption in our current society that the earlier a child can be "trained" in cognitive or motor development the better. In my opinion, this is bad news and it makes the road to the establishment of more developmentally appropriate programs for young children in physical education more difficult.

Motor Development Study Since 1971

In my introduction, I suggested that a second point in trying to move our dreams of 1971 to reality was that motor development research had to grow in quantity and quality and that such research had to be meaningfully communicated to teachers and parents of young children. What of our progress in this area?

Motor development research flourished in the 1930s, was then largely ignored for three decades as the interests of psychologists turned to quantitative assessment of human performance, and was rediscovered in the late 1960s. Researchers in developmental psychology, physical education, and physical therapy, among others, rediscovered the potential in developmental studies for understanding the changing movement of the human being. A new surge of interest in the young child again emerged. This early motor development information base was useful but sparse, and what little was available was limited in content.

Research in motor development still has a distance to go along the scholarship continuum, but we have made impressive progress since the 1971 conference. Clearly the surge of interest begun in the mid to late 1960s has resulted in high quality motor development research. This research has greatly strengthened our information base. It has built on that base; but at the same time the research has moved out in new directions in studying the underlying structures or developmental processes which could help us understand observed developmental change.

In the 1970s and 1980s a significant and necessary occurrence in our coming of age as scholars has been the emergence of increased numbers of serious motor development researchers. These researchers are well grounded in the study of developmental psychology, movement analysis, research skills and techniques, and in specialized allied areas such as neurophysiology or biomechanics, for example, Even with the emergence of more scholars in the area, there are still far too few. Roberton (in press) recently noted that we have only about 20 researchers who have published consistently (defined as at least one to two articles a year), and are working within a well defined research framework.

Yet in our American Alliance for Health, Physical Education, Recreation and Dance Motor Development Academy alone, we have around 2,000 members interested in the application of motor development research to programs of physical education. Think of how many more educators and parents outside our organization are also interested in the research findings. Therefore, though we have made progress, we have great need for more scholars if we are to serve our field effectively.

A second significant and necessary occurrence in our coming of age as motor development scholars has been the emergence of motor development research programs with a line of inquiry growing out of solidly based frames of reference. Such research programs yield multiple studies, each building on the previous one. This is in contrast to early motor development research where, with the exception of the very early work of McGraw (1969, 1945) and Gesell (1954), there were far too few studies resulting from this type of continuous inquiry work. Rather the field of study in motor development until fairly recently was replete with single effort research. In our history, it appears that we were a restless group eager to find a question, to pursue it briefly, and then to go on to something different, leaving our single study findings dangling. It seemed that in our early history, physical educators lacked the discipline and the patience needed to pursue important leads in research that may have been lurking in our single try research.

A third significant and necessary occurrence has been the study of motor development by highly competent researchers approaching the study of underlying structures of developmental change from many different perspectives. We are not just movement pattern describers anymore. While I will argue that detailed description of movement changes in the motor development of children is a necessary part of the total motor development research base, it has always been clear to me that it is not an end point, but only a beginning. Now, we have moved ahead to studies of how and why such observed movement changes do occur.

In the 1970s and 1980s systematic motor development research investigations have fallen generally into three major categories. The first is the area of detailed description and validation of developmental movement sequences. The second is in the area of the study of immediate environmental factors (refers to within a movement experience environment or component of that environment) influencing motor development. The third is in the area of probing underlying structures and processes leading to the understanding and explanation of developmental changes. It is not my intent to review all of the current motor development research. Rather, I will discuss in fairly broad strokes some examples of research and possible applications for programs of physical education for young children in the first two categories, briefly introduce the third category, and finally suggest a few references that may be of help to the teacher of young children.

Inter- and Intra-Task Motor Development Sequences

The first category is systematic detailed movement description and validation of developmental movement sequences. Let me first define what I mean by the term "developmental movement sequences." In our book *Developing Children: Their Changing Movement* (Roberton & Halverson, 1984), we refer to inter-task and intra-task developmental sequences. Inter-task sequencing is defined as the ordering of motor tasks to the time when "primitive" forms of each task are observed to make their first appearance in a child's repertoire. For example, the familiar developmental order or motor "milestones" of standing before walking, walking before running, running before hopping, etc. is an example of inter-task sequencing.

Intra-task developmental sequences are defined as predictable movement changes within a single motor task. For example, you are familiar with the easily observable leg and arm action intra-task changes in walking. In primitive walking the leg action is characterized by short, wide steps with excessive leg lift due to flexion of the thigh at the hip. Little ankle action occurs and the steps are flat-footed. Later, flexion of the thigh at the hip decreases from what it was in the primitive walk. The stride becomes longer and not as "side-to-side" as it was earlier. The base of support narrows. Later, instead of a flat or nearly flat-footed landing, the heel strikes first in foot contact, and the body weight rides over the rest of foot.

In the early or primitive walk, the arms are usually held in what has been called a "high guard" position (Milani-Comparetti & Gidoni, 1967). This may be a protective readiness response in case of loss of balance. Later, the arms will be carried lower but still swinging very little, if at all. Later, they will swing out in opposition with the forward arm swing from the shoulders synchronized with the forward step of the opposite leg (Roberton, 1984).

While inter-task developmental sequencing can be of some help in tracing the developmental continuum of a child as he or she attains the primitive pattern milestone, its use is somewhat limited for the researcher and the teacher interested in the progress of the child beyond the primitive pattern in motor tasks. McGraw (1969, 1945) noted this when she commented that the fact that a child sits before she or he creeps, creeps before he or she walks, and walks before she or he runs or skips, sets up an orderly sequence of events, but it does not denote the course of movement changes in a particular activity. Nor does it reflect the underlying developmental processes.

McGraw's method of detecting movement changes in motor tasks was through use of verbal description of motion pictures of youths moving. She recognized the importance of this type of information in following actual movement pattern changes within tasks, but the verbal description was primarily a means to an end. Of critical interest for McGraw was the study of underlying processes in development, and detailed movement description was an important part of her investigation of the underlying processes.

Picking up on McGraw's lead in her early research, the focus of a substantial portion of the motor development research in the 1970s and 1980s has focused on the discovery of intra-task motor sequences. While this progress is significant for many reasons, it is particularly of practical importance for teachers.

Detailed motor pattern change description and the detection of how within task movement changes are ordered allows us to really "see" the movement changes in the children we teach. It provides information that helps us know what to expect next in their development, and helps us know when we have helped or hindered children's developmental process with our teaching. It provides a basis for deciding how and when to intervene in our attempts to facilitate motor progress. The following references from our laboratory and from the work of others will provide more detailed information about intra-task developmental sequences: Branta, Haubenstricker, and Seefeldt, 1984; Ridenour, 1978; Roberton, 1984; Roberton & Halverson, 1984; Seefeldt & Haubenstricker, 1982.

Effects of Immediate Environment on Motor Development

The second research category in which motor development researchers have recently begun systematic investigations is that of immediate environmental factors influencing motor development. While we are beginning to make some progress in this area, surprisingly, even now, most information on the impact of immediate environmental factors on children's motor development is the result of incidental observations or one-study research. Currently, however, systematic research has been emerging in the work of Barnett, 1980; Barnett & Higgens, 1983; Herkowitz, 1978, 1980; Higgens, 1972; Higgens & Spaeth, 1972; Roberton, 1987; and others.

It appears that in the past we have most often brainstormed ideas about developmentally appropriate movement environments for children and then assumed that these ideas really do "work." While all good researchers and teachers must constantly brainstorm and dream up ways to facilitate change in the motor development of children, the process should not stop at the brainstorm stage. It is often a mistake to assume that our "armchair" ideas, and even ideas recommended by experts do "work" with all children.

I am not minimalizing the importance of the process of creating our own ideas or using those of others in our work. Rather, I am making a plea for careful observation of the result of these ideas in action. We have to check to see if they do facilitate the developmental progress in movement of the children with whom we are working. If not, we have to ask why, and go back to our creative "drawing board" in teaching. Let me give you some examples of immediate environment ideas that logically seemed to be good ideas for promoting progress in motor pattern development in action. They seemed so, but they did not really work in the real world.

I had decided that if I used balls made of fairly soft material and in a size that would be appropriate for a young child's hands, success in catching should improve. So I used a ball a little smaller than a softball made of "nerf" type material. Tossing the ball on a fairly direct path and at a "catchable" speed for a young child, I was surprised to find that while hand contact was good, success in actual catching was not. Even children who had been catching bean bags from the same distance and with the same speed as the ball toss were now dropping the ball.

Why this was so is now very obvious to me, but if I had not carefully observed the effect on the movement of the children of this "logical" assumption of mine, I might not really have spotted the problem. The reason for lack of success in hanging on to the ball was that the material was too "bouncy." The children's hand grasping closure time was too slow for the soft, but "bouncy" ball. Consequently, the ball was out of the hand before the child could successfully grasp it.

In another example, it seemed logical that if children have problems tracking and striking rapidly moving balls, tossing at a very slow speed should enhance their success in striking. While waiting for the cameras to be reloaded, in one of our research filming sessions, I was playing ball with John. We were getting ready to film John in two-handed striking tasks. He was using a plastic bat short and light enough for his size. Using my "make the ball toss very slow so that John can hit it" logic, I picked up a soft, light-weight ball about the size of a softball. I tossed the ball on a fairly direct path, but I kept it as slow as I possibly could and still maintain the trajectory. John continually began his swing too soon and missed the ball.

After several failures (as viewed by him), his total frustration was rapidly approaching. I changed to a slightly heavier, but same-sized ball, and I increased the speed of the tossed ball to coincide with his swing timing. There was immediate success, loss of the frustration clouds, and continued "fun" practice. My a priori assumption that tossing the ball at a very slow rate would enhance John's striking success was not true.

What is true is that young children have a hard time adjusting to objects moving too slowly. They cannot yet "hold back" their swing to time it with the arrival of a very slow moving object. They seem to have a preferred speed at first, and only later can begin to make timing adjustments to cope with objects moving at slower speeds. The work of K. Williams (1982) and Stadulis (1971) supports these observations.

As teachers, we should continue to be imaginative, creative, and to conduct our own informal, careful observations of the effect of our environmental designs on children's developmental progress in movement. Observing the effect of immediate environment (what we say, what equipment we use, and how we design the movement experience) on the motor development is at the heart of teaching.

Much of our environmental research impact information has come from one-study research investigations. Though there is much more to be done by researchers in this area, the cumulative information from such studies does give some help to teachers in planning developmentally appropriate movement experiences for young children. The following "starter" references may be of help on such topics as the influence of equipment size, weight, and color; figure ground effects; and the effect of the speed/path of moving objects on movement patterns of children: Bowers, 1988; Bruce, 1966; Halverson, 1966, 1971a; Herkowitz, 1978, 1980; Morris, 1976; Ridenour, 1974, 1978.

Study of Underlying Processes in Motor Development

A third category of current research in motor development is that of studying underlying processes which might help us to better understand or explain motor developmental change. In the 1940s, neuromaturation was accepted by a substantial number of motor development researchers as the explanation for observed developmental changes in movement. In fact, implicitly or explicitly, this may still be the dominant view held by many psychologists, educators, and parents. In the 1970s and 1980s, however, other views have emerged in motor development research. Of these, information processing theory is one that has received substantial attention.

To date, the most often studied areas within information processing have tended to be developmental differences in children's sensory, long- and short-term memory store, and the rate or speed of information processing. Within the area of short- and long-term memory store, control processes such as encoding, rehearsal, search and retrieval, perceptual sensitivity, and attention have been studied using movement situations. Much of this type of research should be familiar to early childhood educators as it relates to cognitive development, but it may not be automatically transferred as also applicable to motor development.

An extensive review of the work of motor developmentalists in this area is beyond the available space in this paper. I suggest the following "starter" references for those of you who are interested in more specific information for your work with the movement experiences of young children: Clark, 1978; Haywood, 1986; Schmidt, 1982; Thomas, 1980, 1984; H. Williams, 1983.

It is clear from the work reported by these authors and others that the young child's ultimate motor developmental progress can be affected by teachers' and parents' sensitivity and skill in enhancing the information process development of the child in relation to movement experience. Movement play, self-practice in movement skills, and personal exploration of movement activities are important to the child as he or she discovers what is possible in the world of movement. However, knowledge about, and strategies for, coping with movement challenges do not automatically progress to the extent they could for all children. They must be enhanced within the physical education setting through well planned interventions by teachers, parents, and often older children.

While I am sure you may be able to come up with many illustrations of how we can enhance the child's movement progress by our recognition of his or her level of information processes development, let me share one or two.

Children are intrigued by bouncing balls. However, early in development, children are "moved" by the balls rather than "moving" the balls where they want them to go. Anticipating what to expect of a bouncing ball is not automatic for the young child. You may be familiar with what often happens when a young child attempts a "drop and catch game" with a bouncy ball. A very frequent occurrence is that the young child will drop the ball and then immediately flex at the hips to follow the ball down. The result most often is not only a "miss" on the catch but a "hit" in the chest or even the face as the rebounding ball collides with the bent-over child. In most cases, it takes some guidance for the child to "notice" that if the ball is dropped, it will bounce back up. It may also take some verbal rehearsal to help ensure success as a "drop, wait, catch."

Children can easily perform a continuous series of self-chosen movements; that is, they can string together running, kicking a ball, chasing it, picking it up, sauntering around a bit carrying it, and so on. However, performing a requested, continuous series of movements is difficult for a young child. Suppose, for example, the requested series is something like "run to the big ball, pick it up, carry it to the box, drop it in the box, and then sit down in the circle." Telling young children what the series is and then asking them to do it will usually result in a great deal of confusion after the first task of "run to the big ball" has been accomplished. Showing them and then asking them to do it will usually result in the same amount of confusion. Guiding them through the sequence with verbal labeling of each part may be somewhat more successful, especially if the teacher helps the child label and rehearse.

Children do not automatically develop strategies for helping them recall a series of moves. They often need some help in developing strategies. My example is one of a series of unrelated tasks somewhat like the task of trying to recall nonsense syllables. Yet, all game play requires planning or remembering an appropriate series of movements. Thus, the movement series recall or planning challenge is a "real world" challenge. We as teachers have to learn to "see" various common movement series in game demands, for example, and to help the children develop strategies for meeting the movement challenges.

Currently, another process probing theory is that of dynamical systems. This is not an easily understood approach to the study of underlying developmental processes. It is also a much less familiar concept to us as teachers of young children than the first two I reviewed. To date, research in this approach is just beginning to emerge. Thus, there is little actual tested practical application teaching information available at this point. However, the work has promise for untangling some of the mysteries of the underlying processes in motor development.

Consequently, for those who may be interested, I will briefly introduce the approach, taking much of this summary from a recent research report by Roberton and Halverson (1988). A Kugler, Kelso, and Turvey (1982) publication on "naturally developing systems" marked the introduction of this theory in motor development research. Based on principles from theoretical physics/mathematics and Gibson's (1979) ecological psychology, the theory proposes that qualitative (movement pattern) changes are an emergent property of the dynamics of the motor system. That is, increasing the energy input ("scaling up") to a given parameter, such as increasing movement speed, causes qualitative changes when a critical parameter value is reached, just as increasing temperature causes H_2O molecules to appear as ice, water, or steam.

The human neuroskeletal system has a large number of movement possibilities. That is, it is said to have a large number of "degrees of freedom." Trying to understand how these degrees of freedom are functionally organized is challenging and intriguing to the developmentalist.

In dynamical systems theory, the concept of "coordinative structures" is a way of considering this problem. In dynamical systems theory, coordinative structures are essential units in the development of the motor system. They are defined as "temporary marshalling of many degrees of freedom into task-specific functional units" (Kelso, Tuller, Valikiotis-Bateson, & Fowler, 1984, p. 828).

Dynamical systems theory suggests that the establishment of coordination within a skill would consist of the emergence and integration of coordinative structures as the dynamics of the system changed with changing mass, length, and energy flow. Thus, the identification and tracking of coordinative structures is an important research step.

Clark and Whithall (in press) help us to understand what the dynamical systems approach means in the example of the problem facing an infant who wishes to change her location. They point out that when the infant is 2 months old, the solution to the problem may be much different from when she is 12 months old. In 10 months, there are changes in morphology, the central nervous system, and the muscular system in the infant that must be taken into account by the neuromuscular system if the movement goal is to be reached.

To think that with each change, the nervous system must try to send out new specific "commands" to each muscle group has little credibility. Thus, trying to detect possible stability and change in coordinative structures holds out a very substantial promise for unlocking some of the mysteries of how development "happens."

Communicating Motor Development Research to Teachers

It is clear that since the 1971 conference, there has been a substantial increase in the quantity and quality of motor development research. This part of the story is very encouraging, but clearly, if such information is to affect the lives of young children, it must be used. How are we doing in this area of effectively communicating motor development research findings to teachers?

In answer to that question, the news is both good and bad. The bad news is that current motor development findings have barely dented current child development texts. In a number of recent child development references published in the past eight years, motor development information ranges from 0 to approximately 2 to 3 pages in most of the texts and a maximum of 9 in one text.

The information included is typically mixed with growth information as if motor development and growth are synonymous. In general the little motor development information included in these texts of the 1980s is still based primarily on the early motor development research of the 1930s and 1940s. There is amazingly little attention given to any of the 1970-1980 research.

What this suggests is that we obviously have not reached the educational and developmental psychologists who write these texts; or if we have, motor development information is not considered essential or important, or they have not bothered to do thorough and updated literature reviews.

If physical education has been the forgotten aspect of early childhood education, certainly, motor development research has been the forgotten or ignored field by child development textbook writers. Yet, most physical and early childhood teachers must take at least one course in which these texts will be the central requirement.

The good news, however, is that the post-1971 surge of interest and action in motor development has resulted in the production of more than 12 motor development texts; an increase in the amount of motor development information included in current texts on physical education for preschool and elementary aged children; and increased but still somewhat sparse current motor development information included in some early childhood program and methodology texts.

This good news reflects progress in providing motor development information for teachers of young children, but we still have a distance to go in effectively communicating what we know about motor development. Textbook writers, teachers of teachers, and workshop leaders all face a significant challenge in the 1990s. We mean well, but we are still leaving a very large gap in the guides we develop for fledgling teachers of children.

For example, we spend pages and pages listing the details of developmental movement sequences, but we are still weak in developing ways for the teacher to go from reading about such developmental changes to the next step of actually learning to "see" movement. We have not yet really faced up to the amount of time and effort that is necessary for teachers to become keen observers of the moving child.

Even when the effort and time is given for teachers to have a chance to become skilled movement observers, we have failed to develop adequate meaningful help in our writings to aid the teachers to develop into keen interpreters of what they are seeing in the movement. Unless the teacher can see, and interpret what is seen, the necessary step of deciding when and how to intervene to facilitate developmental progress for a child is difficult, if not impossible. What I am suggesting is not easy. We have made progress in this area since 1971. My sense, however, is that we know more than we have effectively communicated to the teachers we need to help.

Inservice and Preservice Experience

Inservice and preservice physical and early childhood education teachers must have substantial observation, assisting, and student teaching experience in quality movement programs in preparation for developing such programs in their own schools. This requisite for accomplishing our dreams of 1971 is one of our greatest challenges in the 1990s. The other requisites I have discussed might be "do-able" by a relatively small number of writers and researchers, but this task of providing guided experience in movement programs for children impacts on the work of all teachers of teachers and teachers of young children.

The developing child is an incredibly complicated being. To facilitate maximum developmental progress in the cognitive, social, emotional, and motor development of the individual young child is an awesome task. Any honest educator knows that it is really an unattainable goal. We can, however, get closer than we have in the past.

This 1988 conference was an important beginning in the attempt to meet the 1990 challenge for all physical and early childhood educators. What we shared, and most importantly, how we take what we believe about the significance of motor development of young children into action, will reflect what we value in designing their physical education programs.

It is our hope that developmentally appropriate programs will quickly become the dominant model in our work and will quickly supplant outmoded developmentally inappropriate activity-centered models, and that child-centered, developmentally based physical education programs will be the "remembered," not the "forgotten," aspect of early childhood education.

References begin on next page.

References

Barnett, B. (1980). Movement organization as reflected in the jumping patterns of young children in different environmental contexts. Proceedings of the Research Section, National Convention of the American Alliance for Health, Physical Education, Recreation and Dance 39. Detroit, Michigan. (Abstract).

Barnett, B., & Higgens, J.R. (1983). The effect of environmental and optic field flow changes on the organization of movements by children. American Alliance for Health, Physical Education, Recreation and Dance 98. Minneapolis, Minnesota. (Abstract).

Barrett, K.R. (1973). I wish I could fly — A philosophy in motion. In P. Leply & R.A. Cobb (Eds.), *Contemporary philosophers in physical education and athletics*. Columbus, Ohio: Charles E. Merrill.

Bowers, L. (1988). Children need playgrounds — But playgrounds need help. *Journal of Physical Education & Recreation*, 59, 47-51.

Branta, G., Haubenstricker, J., & Seefeldt, V. (1984). Age changes in motor skills during childhood and adolescence. In R. L. Terjung (Ed.,), *Exercise and sport science reviews*, 12, 457-520. Lexington, Maine: Collamore Press.

Bruce, R. (1966). The effects of variations in ball trajectory upon the catching performance of elementary school children. (Doctoral dissertation, University of Wisconsin-Madison, Dissertation). Dissertation Abstracts International, 28, 480A.

Clark, J.E. (1982). Developmental differences in response processing. *Journal of Motor Behavior*, 14, 247-254.

Clark, J.E., & Whithall, J. (in press). Changing patterns of locomotion from walking to skipping. In M. Woollacott & A. Shumway-Cook (Eds.), *A development of posture and gait across the lifespan*. Columbia, SC: University of South Carolina Press.

Gallahue, D. (1982). *Developmental movement experiences for children*. New York: Wiley.

Gesell, A. (1954). The ontogenesis of infant behavior. In L. Carmichael (Ed.), *Manual of child psychology* (2nd ed.). New York: Wiley.

Gibson, J.J. (1979). *An ecological approach to visual perception*. Boston: Houghton Mifflin.

Graham, G., Holt/Hale, S., & Parker, M. (1987). *Children moving: A teachers guide to developing a successful physical education program* (2nd ed.). Palo Alto, CA: Mayfield.

Halverson, L.E. (1966). Development of motor patterns in children. *Quest*, 6, 44-53.

Halverson, L.E. (1971a). The young child—The significance of motor development. In G. Engstrom (Ed.), *The significance of the young child's motor development*, 17-32. Proceedings of the conference sponsored by the American Association for Health, Physical Education and Recreation, and the National Association for the Education of Young Children: Washington, D.C.

Halverson, L.E. (1971b). A look at the pre-school child. *Journal of Health, Physical Education and Recreation*, 42, 31-35.

Halverson, L.E., & Roberton, M.A. (1979). The effects of instruction on overhand throwing development in children. In K. Newell & G. Roberts (Eds.), *Psychology of motor behavior and sport—1978*, 258-269. Champaign, Illinois: Human Kinetics.

Haywood, K. (1986). *Lifespan motor development*. Champaign, IL: Human Kinetics.

Herkowitz, J. (1978). Developmental task analysis: The design of movement experiences and evaluation of motor development status. In M. Ridenour (Ed.), *Motor development: Issues and applications*, 139-164. Princeton, NJ: Princeton Book Company.

Herkowitz, J. (1984). Developmentally engineered equipment and playgrounds. In J. Thomas (Ed.), *Movement development during childhood and adolescence*, 139-173. Minneapolis: Burgess.

Higgens, J.R. (1972). Movement to match environmental demands. *Research Quarterly*, 43, 313-336.

Higgens, J.R., & Spaeth, R. (1972). Relationship between consistency of movement and environmental condition. *Quest*, 17, 61-69.

Kelso, J.A.S., Tuller, B., Vatikiotis-Bateson, E., & Fowler, C. (1984). Functionally specific articulatory cooperation following jaw perturbations during speech. Evidence for coordinative structures. *Journal of Experimental Psychology: Human Perception and Performance*, 10, 812-832.

Kugler, P., Kelso, J.A.S., & Turvey, M. (1982). On the control and coordination of naturally developing systems. In J.A.S. Kelso & J.E. Clark (Eds.), *The development of movement and coordination*, 5-78. New York: Wiley.

Logsdon, B., Ammons, M., Barrett, K., Broer, M., Halverson, L., McGee, M., & Roberton, M.A. (1984). *Physical education for children: A focus on the teaching process* (2nd ed.). Philadelphia: Lea & Febiger.

McGraw, M. (1969). *The neuromuscular maturation of the human infant*. New York: Hafner. (Original work published in 1945.)

Milani Comparetti, A., & Gidoni, E. (1967). Routine developmental examination in normal and retarded children. *Developmental Medicine and Child Neurology*, 9, 631-638.

Morris, G.D. (1976). Effects a ball and background color have upon the catching performance of elementary school children. *Research Quarterly for Exercise and Sport*, 47, 409-416.

Ridenour, M. (1974). Influence of object size, speed, and direction on the perception of a movement object. *Research Quarterly for Exercise and Sport*, 45, 193-301.

Ridenour, M. (1978). Programs to optimize infant motor development. In M. Ridenour (Ed.), *Motor development: Issues and applications*, 39-61. Princeton, New Jersey: Princeton Book Co.

Riley, M., Barrett, K., Martinek, T., & Roberton, M.A. (1980). *Children and youth in action: Physical activities and sports*. Washington, DC: U.S. Government Printing Office.

Roberton, M.A. (1984). Changing motor patterns in childhood. In J. Thomas (Ed.), *Motor development during childhood and adolescence*, 48-90. Minneapolis: Burgess.

Roberton, M.A. (1987). Developmental level as a function of the immediate environment. In J.E. Clark & J. Humphrey (Eds.), *Advances in motor development research*, 1-15. New York: ANS Press.

Roberton, M.A. (in press). Future directions in motor development research: Applied aspects. In J. Skinner (Ed.), *Future directions in exercise/sport research*. Champaign, IL: Human Kinetics.

Roberton, M.A., & Halverson, L. (1984). *Developing children: Their changing movement: A guide for teachers*. Philadelphia: Lea & Febiger.

Roberton, M.A., & Halverson, L. (1988). The development of locomotor coordination: Longitudinal change and variance. *Journal of Motor Behavior*, 20, 197-241.

Schmidt, R. (1982). *Motor control and learning: A behavioral emphasis*. Champaign, IL: Human Kinetics Publishers, Inc.

Seefeldt, V., & Haubenstricker, J. (1982). Patterns, phases, or stages: An analytical model for the study of developmental movement. In J.A.S. Kelso and J.E. Clark (Eds.), *The development of movement control and coordination*. New York: John Wiley & Sons.

Stadulis, R. (1971). Coincident anticipation behavior of children. Doctoral dissertation, Columbia University.

Thomas, J.R. (1980). Acquisition of motor skills: Information processing differences between children and adults. *Research Quarterly for Exercise and Sport*, 51, 158-173.

Thomas, J.R., Thomas, K., Lee, A., Testeran, E., & Ashy, M. (1983). Age differences in use of strategy for recall of movement in a large scale environment. *Research Quarterly for Exercise and Sport*, 54, 264-272.

Whitehurst, K. (1971). The young child: What movement means to him. In G. Engstrom (Ed.), *The significance of the young child's motor development*, 51-55. Proceedings of a conference sponsored by the American Association for Health, Physical Education and Recreation and the National Association for the Education of Young Children, Washington, D.C.

Williams, H. (1983). *Perceptual and motor development*. Englewood Cliffs, NJ: Prentice-Hall.

Williams, K. (1982). Age differences in performances of a coincident anticipation task. Application of a modified information processing model (Doctoral dissertation, University of Wisconsin-Madison). Dissertation Abstracts International, 43, 1471A.

What Is a Truly Developmentally Appropriate Physical Education Program for Children?

Educators must think in terms of the children they are teaching and not what activity can keep a class of children "busy, happy and good."

Steven Grineski

Teachers must understand the meaning of developmentally appropriate practice (Bredekamp, 1987, 1991; Elkind, 1989; Kessler, 1991) and apply this understanding in elementary school physical education programs (Barrett & Williams, 1991; Wikgren, 1991). This article describes developmentally appropriate physical education, gives guidelines for determining developmentally appropriate and inappropriate practices, and provides examples illustrating these practices.

A program of physical education for children that is developmentally appropriate is based on three principles of motor skill develolpment: (1) motor skill development is sequential and age-related; (2) children progress through similar sequences of motor development; and (3) the rates at which children progress through sequences of motor development vary. Combined, these principles result in developmentally appropriate physical education for children.

1. Motor skill development is sequential and age-related. Researchers of motor development (Cratty, 1979; Haubenstricker & Seefeldt, 1986; Zaichkowsky, Zaichkowsky, & Martinek, 1980) suggest that children within a given age range benefit from instruction with age-appropriate tasks. Frameworks for describing age-related motor skill development have been developed (e.g., Gallahue, Werner, & Luedtke, 1975; Seefeldt, 1979). To illustrate age-related and sequential motor development for elementary school children, the following age periods and accompanying phases are suggested: 5 to 7 years—movement awareness concepts (e.g., spatial awareness); 5 to 8 years—basic motor skills (i.e., nonlocomotor, locomotor, and manipulative); 9 to 11 years—specialized game, gymnastic, dance, and aquatic skills; and 10 to 12 years—application of movement awareness concepts/basic motor skills/specialized skills in physical education activities.

The principle of sequential and age-related motor skill development may be applied in a variety of ways. Primary grade children benefit from a program of learning movement awareness concepts emphasizing student-centered or problem-solving teaching. For example, if a teacher wanted first grade children to better understand the movement awareness concepts of general space and pathways, the following task could be posed: "Pretend you have paint on the soles of your shoes. How curvy a painted lkine can you make as you move throughout the entire gym space?" On the other hand, when specific performance of a basic motor skill is desired, teacher-directed or command teaching may be used. For example, if learning to throw a small ball overhand is the desired lesson outcome, the following directives could be made: "Step forward with your nonthrowing foot, and put your throwing elbow behind your shoulder. Watch me. Now you do it." Following

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this foundation of exploration with movement awareness concepts and directed learning with basic motor skills, intermediate grade children should have opportunities to develop specialized skills (e.g., volleyball forearm pass). This prior learning should be applied in a program of physical education activities.

2. Motor skill progression is similar for all children. The second developmental principle is that all children, with the exception of children exhibiting abnormal motor development, progress through similar sequentially ordered systems (i.e., hierarchy or continuum) of motor skill development. Two sequential systems of motor development have been identified: intratask and intertask (Roberton, 1984).

Intratask developmental sequences are incremental steps leading to mature performance within a skill; for example, throwing: (1) casting, (2) hurling, (3) homolateral pattern, (4) crosslateral pattern. Intertask developmental sequences describe movement along a hierarchy from one motor skill to the next (e.g., walk, run, leap, jump, gallop, hop, skip). Descriptions of intratask and intertask developmental sequences for various skills have been recorded (Gallahue, 1982; Roberton, 1984; Wickstrom, 1983). Thus, the majority of children not only follow similar sequences of motor development, but also arrive at developmental points at approximately the same age.

3. Rate of motor development varies. Although motor development is age-related, with many children progressing through the same continuum, the rate at which children progress through sequences varies: development is not age-dependent. This variation results in individual differences among same age children. Reasons for differences may include the following variables: physical size, learning potential, impairment, emotional maturation, practice opportunities, cultural support, innate motor ability, environment influences, and motivation (Haubenstricker & Seefeldt, 1986). An example of this principle can be seen when a class of primary grade children participate in obstacle courses designed to promote spatial awareness and locomotor skill learning. Although many children negotiate movements related to moving over, under, and around; changing speeds, directions, and pathways; and alternating locomotor skills, some children are unable to execute the movements effectively and efficiently, while some find it too easy. As a result, accommodations and adjustments are made to the obstacle course (e.g., lowering or raising the height of the vaulting box) to meet student needs, thus promoting successful learning for all learners.

These three principles characterize a developmentally appropriate physical education program. This program is "developmental" because it provides specific skill learning that is age-related (principle #1) and sequentially ordered (principle #2), and "appropriate" as a result of accommodating for student needs that result from varying rates of development (principle #3).

Learning activities are presented in the developmentally appropriate program that satisfy age-appropriate and individually appropriate needs, thus inviting successful learning.

Guidelines for Judging Physical Education Practices

Given this description of developmentally appropriate physical education, four guidelines are suggested for judging which physical education practices are truly developmentally appropriate. These guidelines are in concert with COPEC's Position Statement:

1. Orderly sequence of motor skill learning. Do curriculum planning decisions reflect the cumulative nature of a hierarchy of motor skill development—movement awareness learning leading to basic motor and specialized skill development and then application in a program of diverse physical education activity? Does the planning and teaching of motor skills follow intratask and intertask sequences?

2. Allowing for individual differences. Are options and modifications made that account for the individual differences among children, or are all students required to perform the same skill/activity in the same learning time with the same equipment and in a similar manner?

3. Appropriate goal structures. Are individualistic and cooperative goal structures used to promote student learning, or is successful learning defined as learning more than others? What is most important—skill improvement or proving superiority?

4. Ample learning time. Do all students receive appropriate amounts of time for learning and participating, or are learning opportunities contingent upon skill level, luck, power, aggression, or being in the right spot at the right time? Is there a belief that all children have an equal right to learning opportunities and participation in physical education?

A prevalent elementary school physical education practice not satisfying the four guidelines is the playing of large group competitive activities (e.g., dodgeball) across all grade levels with little or no opportunity for all students to acquire the necessary psychomotor skills (e.g., dodging, throwing) and cognitive concepts (e.g., anticipating, faking) needed for successful participation. Other examples of such activities include sideline games, kickball, rope skipping contests, and team sports. Many times these large group activities are included in the curriculum to the exclusion of dance, gymnastic, and other individual or small group activities.

Typically, aggressive and highly skilled students who possess necessary skills dominate in these activities. Interestingly, gymnasium observations suggest that some skilled students may be bored and experience lack of challenge as a result of repeating similar activities year after year. Upon hearing directions from the teacher, one highly skilled fifth grade student replied, "Why do we do the same things every year?" Observations made during a sideline soccer game revealed that only a small number of students actually interacted with other players and the ball, while most students had limited opportunity for participation. Three students neither touched the ball nor ran the length of the gymnasium during the lesson.

Similar patterns of observation have been made during the more "popular" large groups games (e.g., kickball, dodgeball, softball) that typically comprise elementary school physical education curriculums (Ross et al., 1987). Minimal use of equipment (e.g., one ball for 30 children), standardized rules/procedures (e.g., using regulation size court, net height, ball, and service line in volleyball), and structuring that highlights comparative worth among children (e.g., contests to determine who performs the most repetitions in rope skipping) are also characteristics associated with these "undesirable" practices.

Conversely, teaching and learning in elementary school physical education that is developmentally appropriate and satisfiedsthe four guidelines are characterized by the following practices:

1. Orderly sequence of motor skill learning. Primary grade children participate in units of instruction focusing on exploration and acquisition of movement awareness (e.g., general space) and basic motor skill (e.g., kicking) themes. This learning follows established intratask (i.e., incremental steps leading to mature performance within a skill) and intertask (i.e., movement along a hierarchy from one skill to the next) developmental sequences. Chi dren in the intermediate grades participate in units of instruction that apply previous theme learning (i.e., movement awareness, basic motor skills) and provide specialized skill instruction necessary for participation in a program of physical education activities. For example, to play a modified soccer game, instrauction in movement awareness themes of general space, self-space, range, and pathways; basic motor skills themes of running, sliding, and kicking; and the specialized skills associated with goal tending would be provided. As a result of this developmentally sound foundation, potential for successful participation increases.

2. Allowing for individual differences. Options and modifications are always made to any aspect of the instructional program to better meet learners' individual needs. All children should know they are the most important, while rules, equipment, size of field, and player positions are of secondary importance. Students are allowed necessary time for learning and not rushed into participation that would result in unsuccessful learning. For example, small-sided games are offered to provide appropriate challenges for all learners.

3. Appropriate goal structures. The instructional program is centered on learning that uses individually and cooperatively structured goals. Individualized goal setting is used for locomotor and manipulative skill acquisition, as well as personalized contracts for physical fitness training. Small group problem-solving experiences employ cooperative goals to promote learning across the psychomotor, cognitive, and affective domains: student-designed games and dances are used to promote learning in these domains. Competitive activities are offered to students of similar ability and those interested in measuring their skill level in relation to others.

4. Ample learning time. All students have equal opportunities for learning and participating in the program. Learning and participating opportunities are the right of all students.

Developmentally appropriate physical education increases the likelihood of enjoyable, challenging, and successful learning for all students. Teachers need to continue or begin to think in terms of the children they are teaching and not what activity can keep a class of chidlren "busy, happy and good" (Placek, 1982). Our instructions should be geared to meet age group needs while allowing for the individual differences within any group of children.

References

Barrett, K., & Williams, K. (1991). Reactions to COPEC's developmentally appropriate physical education for children. *Teaching Elementary Physical Education*, 4(2), 5, 11.

Bredekamp, S. (Ed.). (1987). *Developmentally appropriate practice in early childhood programs serving children birth through age 8* (expanded ed.). Washington, DC: National Association for the Education of Young Children.

Bredekamp, S. (1991). Redeveloping early childhood education. *Early Childhood Education Research Quarterly*, 6, 183-197.

Cratty, B. (1979). *Perceptual and motor development in infants and children* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Elkind, D. (1989). Developmentally appropriate practice: Philosophical and practical limitations. *Phi Delta Kappan*, 2a, 113-117.

Gallahue, D., Werner, P., & Luedke, C. (1975). *A conceptual approach to moving and learning*. New York: John Wiley and Sons.

Haubenstricker, J., & Seefeldt, V. (1986). Acquisition of motor skills. In V. Seefeldt (Ed.), *Physical activity and well-being* (pp. 42-102). Reston, VA: AAHPERD.

Kessler, S. (1991). Alternate perspectives on early childhood education. *Early Childhood Education Research Quarterly*, 6, 183-197.

Placek, J. (1982). Conceptions of success in teaching: Busy, happy or good? In T. Templin & J. Olson, *Teaching in physical education* (pp. 46-55). Champaign, IL: Human Kinetics.

Roberton, M. (1984) Changing motor patterns during childhood. In J. Thomas (Ed.), *Motor development during childhood and adolescence* (pp. 48-90). Minneapolis: Burgess Publishing Co.

Ross, J., Pate, R., Corbin, C., Delpy, C., & Gold, R. (1987). The National Children and Youth Fitness Study I: What are kids doing in school physical education programs? *Journal of Physical Education, Recreation and Dance*, 58(9), 78-84.

Seefeldt, V. (1979). Developmental motor patterns: Implications for elementary school physical education. In C. Nadeau, W. Holliwell, K. Newell, & G. Roberts (Eds.), *Psychology of motor behavior and sport* (p. 317). Champaign, IL: Human Kinetics.

Wickstrom R. (1983). *Fundamental movement patterns* (3rd ed.). Philadelphia: Lea and Febiger.

Wikgren, S. (1991) "Developmentally appropriate physical education"—A move toward consistent quality. *Teaching Elementary Physical Education*, 2(4), 1, 4.

Zaichkowsky, L., Zaichkowsky, L. & Martinek, T. (1980). *Growth and development: The child and physical activity*. St. Louis: C.V. Mosby Company.

Developmental Sequences for Catching a Small Ball: A Prelongitudinal Screening

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Developmental sequences are identified for many skills (e.g., hopping and throwing). Sequences are hypothesized but not validated for catching. Two purposes of this investigation were to validate hypothesized catching sequences and examine the importance of task constraints on catching performance. Seventy-two subjects (5–12 years of age) were videotaped as they attempted to catch a small (10-cm) ball, tossed to three locations: (a) directly to the body, (b) at the forehead, and (c) to various other locations. Trials were categorized using developmental sequences including four components: arm preparation, arm reception, hands, and body. The data were analyzed by catching condition using the prelongitudinal screening procedure described by Roberton, Williams, and Langendorfer (1980). Preliminary screening resulted in clarification of descriptions for several developmental levels. Movement sequences for hand and body components were comprehensive and age-related for the groups studied. Task conditions differently constrained children of different ages. Arm components did not meet the Roberton et al. criteria. Combining them may be warranted. Varying ball size or type is needed to test the comprehensiveness of the proposed sequences for other catching skills.

Over the years, a large part of the work of motor development specialists has involved hypothesizing and validating developmental sequences for fundamental motor skills. In these studies, children and adults of a variety of ages typically are observed and categorized. Results of these studies show a positive, but not absolute, relationship between subject age and skill level. Generally, older subjects are categorized as having more advanced movement patterns; younger subjects are characaterized by less advanced movement patterns.

In their investigations of age-related skill differences, experimenters have found it necessary to specify the conditions under which sequences are valid. Most of these are based on a primary constraint: that performers expend maximal effort. For example, Roberton's (1977, 1978) developmental sequences described changes for a forceful overarm throw. Clark and Phillips (1985) described sequences for the standing long jump performed for maximum distance. Investigators suggest implicitly and explicitly that their results would differ if less than maximal effort were given. They contend that less than maximal effort would result in patterns characterized as "less advanced." Subjects evaluated as using advanced patterns to throw a ball for greatest distance, for example, would most likely use a less advanced pattern to toss a ball to a partner standing 10 feet away (Roberton, 1987).

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The examples outlined above suggest task demands are important considerations in the performance of movement skills. This importance has long been suggested by educators and researchers, although often in nonsystematic ways. Poe (1976), for example, found 2-year-old children were able to complete an immature jump-and-reach pattern when a balloon was suspended over their heads. Without the suspended target, they did not. In fact, an early investigator (Jenkins, 1930) suggested children as young as 3 years of age could not successfully perform a vertical jump. Halverson and coauthors (Halverson, 1971; Halverson, Roberton, & Harper, 1973) discussed the importance of the shape of the environment in investigations of motor skills. One example describes "regression" to a developmentally less advanced pattern by children who switched from small, light paddles to larger, heavier paddles.

Although the importance of task demands often is commented on, it is generally done so as a rationale for studying a motor skill within that specific context. Systematic developmental studies of motor skills across a variety of situations are rare. The exception is Herkowitz's (1978) formulation of a developmental task analysis framework as a way to formalize investigations of task demands on movement skills. Unfortunately, little systematic study was generated by its formulation.

The few investigations examining the context in which a skill is performed have emphasized success or failure within a single category of action. That is, were children able to perform the skill, regardless of the form of the action? For example, DuRandt (1985) found different aged children were successful at catching balls with different trajectories. In general, younger children caught balls with flatter trajectories; they often missed balls coming from medium or high trajectories. Older children were more successful, regardless of the flight path. Information regarding placement of the ball with reference to the child's body was not given. Color (Isaacs, 1980) and background contrast (Morris, 1976) also have been examined. A child's "favorite" color, or one that contrasts most with the background, appears to be the most easily caught by younger subjects. None of these investigations looked at the pattern used to catch, however.

A purpose of this investigation, then, was to begin a systematic study of the relationship of age and task demands on the performance of a fundamental motor skill, two-handed catching. The general format of Herkowitz's developmental task analysis was used to vary the level of task difficulty. Herkowitz (1978) suggested analyzing a fundamental motor skill in terms of any task or environmental factor that might influence performance. Then, levels of difficulty within each factor are hypothesized. For two-handed catching, factors such as ball size, "graspability," placement, and trajectory of the toss are expected to influence success. Once these and other factors are identified, a continuum of hypothesized difficulty is generated for each category. For example, a large ball typically is hypothesized to be more easily caught than a small ball. Once categories and levels of difficulty are determined, testing may begin. In this investigation, levels of a single category were tested. The category or task demand examined was the location of the catch. It was hypothesized that balls thrown directly to the body would be most easily caught, whereas objects thrown over the head or out to the side would provide a greater challenge.

A second purpose of this investigation was to examine the movement patterns used by subjects as they performed. Roberton (1977, 1978) proposed looking at changes in motor skills by observing segmental differences in development using a "component approach." The component approach defines movement components as combinations of joint actions that comprise total body movement in executing motor skills (Roberton & Halverson, 1984).

Examples of movement components are trunk, leg, and hand actions performed during the course of a motor skill. Each component is arranged in "steps," hierarchically ordered to describe development from a pattern's initial appearance to skilled execution of the motor skill.

Research involving validation of developmental sequences generally incorporates cross-sectional (Clark & Phillips, 1985; Roberton, 1977; Williams, 1980) or longitudinal designs (Halverson, Roberton, & Langendorfer, 1982; Roberton & Halverson, 1988). Cross-sectional study involves testing several different-aged groups of subjects at one time and has the advantage of being fairly economical. However, cross-sectional data may be confounded by cohort differences and do not provide a "true" look at developmental change. Longitudinal study, or repeated tests of the same subjects, relays the most concrete evidence of valid developmental sequences. Expense, subject attrition, and time requirements, however, often make longitudinal study unappealing. Although validation through longitudinal study is an important goal of the motor development specialist, Roberton, Williams, and Langendorfer (1980) suggested the use of cross-sectional study as a viable prelongitudinal screening method. They proposed if developmental sequences were supported cross-sectionally, further longitudinal validation was warranted.

Roberton et al. (1980) suggested prescreening developmental sequences cross-sectionally could aid the investigator in defining developmental sequences prior to time-consuming longitudinal study. The basic principle underlying prelongitudinal screening is to test subjects of varying ages and then examine the frequencies of occurrence for each developmental level. Determination of how well these patterns coincide with a hypothesized longitudinal model gives the investigator the opportunity to determine which sequences have the greatest potential to "hold up" under further longitudinal scrutiny. Thus an additional purpose of this investigation was to examine the validity of the proposed developmental sequences for two-handed catching cross-sectionally and use these data to evaluate their appropriateness for further longitudinal study.

Procedures

Formulation of the developmental sequences

Roberton and colleagues (1980) suggested prelongitudinal, cross-sectional screening be used as an initial step in the validation procedure. First, investigators would hypothesize a developmental sequence. Then, data would be collected from an appropriate sample of subjects. Subjects' performances would be evaluated and compared with the hypothesized probablistic longitudinal model. Accordingly, the youngest subjects would be expected to exhibit the least mature motor patterns, while older subjects would exhibit more advanced patterns of movement. In addition, steps within the sequence should occur in proper order. That is, Step 1 of any component would be modal early and decline over time. Then, Step 2 would be observed modally, followed by its decline, and so on. Using these criteria, the accuracy of the proposed developmental sequence would be evaluated by how closely it matches the hypothesized longitudinal model.

The movement components used in this investigation were originally formulated by Harper in 1979 (cited in Roberton & Halverson, 1984). She identified three major components: arm, hand, and body actions. The arm component was divided further into two temporal phases: arm preparation and arm reception. Within each of the four components, developmental steps or levels were hierarchically arranged from least to most advanced. Pilot work indicated a need to modify these sequences. Observation and categorization of 24 children (5.5 to 13 years of age) suggested Harper's original sequences were not comprehensive. Based on the pilot work, a revision of Harper's sequence was proposed. Table 1 describes the modified movement components tested in this investigation.

Table 1. Developmental levels within four components of catching

Preparation: Arm Component	
Step 1.	The arms await the ball toss, outstretched with elbows extended.
Step 2.	The arms await the ball toss with some shoulder flexion still apparent but flexion now apparent in the elbows.
Step 3.	The arms await the ball in a relaxed posture at the sides of the body or slightly ahead of the body. The elbows may be flexed.
Reception: Arm Component	
Step 1.	The arms remain outstretched and the elbows rigid. Little to no "give" occurs, so the ball bounces off the arms.
Step 2.	The elbows flex to carry the hands upward toward the face. Initially ball contact is primarily with the arms, and the object is trapped against the body.
Step 3.	Initial contact is with the hands. If unsuccessful in using the fingers, the child may still trap the ball against the chest. The hands still move upward toward the face.
Step 4.	The arms are transversely adducted in a clapping motion to attempt catching the ball in the hands. The elbows flex and the shoulders extend to bring the ball down and toward the body.
Step 5.	Ball contact is made with the hands. The elbows still flex but the shoulders extend, bringing the ball down and toward the body rather than up toward the face.
Hand Component	
Step 1.	The palms of the hands face upward. (Rolling balls elicit a palms down, trapping action.)
Step 2.	The palms of the hands face each other.
Step 3.	The palms of the hands are adjusted to the flight and size of the oncoming object. Thumbs or little fingers are placed close together, depending on the height of the flight path.
Body Component	
Step 1.	No adjustment of the body occurs in response to the flight path of the ball.
Step 2.	The arms and trunk begin to move in relation to the ball flight path.
Step 3.	The feet and arms move to adjust to the path of the ball, but the head remains erect, creating an awkward movement to the ball. The catcher seems to be fighting to remain balanced.
Step 4.	The feet, trunk, and arms all move to adjust to the path of the oncoming ball

Note. These sequences had not been validated. They were adapted from the developmental sequences hypothesized by Harper (cited in Roberton & Halverson, 1984).

Subjects

Seventy-two children, ranging in age from 5 to 12 years, were participants in this study. Twenty-four children were in the 5–6-year-old age group (*M* = 6.18; *SD* = .47). Fifteen children were in the 7–8-year-old age group (*M* = 7.93; *SD* = .70). Sixteen children were in the 9–10-year-old age group (*M* = 9.90; *SD* = .66), and seventeen children were in the 11–12-year-old age group (*M* = 11.51; *SD* = .44). All of the children received physical education instruction one day per week. The children were volunteers from an elementary school in Kernersville, North Carolina. Parents or guardians read and signed informed consent forms prior to each child's particpation.

Data collection and reduction

The children were filmed simultaneously from anterior and lateral views using Panasonic PV330 and AG170 shuttered video cameras, respectively. Shutter speed for each filming session was 1/250th of a second. Distance from camera to subject was 9.15 m (both fields of view).

The children were filmed as they attempted to catch a soft, leather-covered yarn ball, 10 cm in diameter, which was tossed to one of three different locations. The first catching protocol required subjects (*N* = 72)to catch a ball tossed directly at the torso. Subjects also were required to catch a ball tossed at either their forehead or slightly above the head. Finally, some subjects (*N* = 32) attempted to catch balls tossed to their right or left, within their attainable reach. These data formed a portion of a larger set of data. Therefore, all subjects were not tested under all conditions. At least three tosses were made to each location. Subjects were sometimes given additional tosses to a location so that they could experience success during the test (defined as catching the ball). Young or less skilled subjects often were given additional tosses to the torso, anticipating their greater difficulty catching balls tossed to other locations. Trials in which the subject did not attempt a catch, or the attempt was not in earnest, were omitted from analysis.

Subjects were given no instruction immediately prior to the filming session. Verbal information regarding the placement of each toss also was withheld in an attempt to elicit maximal performance. A ball machine was not used for this investigation, as it was determined the younger subjects were more comfortable having a "real" person tossing the ball. To maximize consistency, however, one person made all the tosses used in this investigation. All balls were thrown underhand, at a moderate pace, with an approximate arc peak 2 m above ground. This peak was slightly lower for shorter subjects and slightly higher for taller subjects. An observer was positioned beside the lateral view camera and monitored tosses for acceptability. Poor tosses were repeated. The tosser was positioned 7.6 m in front of the catchers.

A total of 549 trials were available for analysis. This included 232 trials where the toss was directed to the body, 204 trials where the toss was directed to the forehead or slightly higher, and 113 trials where the toss was directed to the right or left of the catcher. All trials were analyzed using the three criteria for validation suggested by Roberton et al. (1980): (a) Are the hypothesized component sequences comprehensive and inclusive? (b) Do the observed data follow an age-related ordering similar to the sequence of the hypothesized components? and (c) Was the sine of the slope of the age-related function accurate across ages?

Reliability of categorizations

The same judges who revised Harper's original sequences (both graduate students in exercise and sport science) analyzed the videotaped records to determine each subject's component categorizations. Before reducing all the data, 30 trials were randomly chosen and categorized by each judge to attain a measure of interjudge objectivity. Percentage of exact agreement between the judges was used as the measure of objectivity. The same 30 trials were analyzed approximately one year later to determine intrajudge objectivity. Inter- and intrajudge agreement was adequate if an 84% criterion of exact agreement was met. Both interjudge and intrajudge percent of exact agreement ranged from 90% to 96%. Because of the high level of interjudge agreement, the 549 trials then were divided equally between the two judges for analysis and categorization.

Data analysis

Analysis of the data was accomplished using a Panasonic AG-6300 research grade video cassette player and a Sony Trinitron monitor. This system had stop action and single frame advance capabilities. The data were categorized and tabulated for each movement component. Graphs of each catching condition were made by plotting the frequency of occurrence for each step within a component across the ages tested. These graphs then were examined to determine how closely they met the criteria specified by Roberton et al. (1980).

Results and Discussion

For each component, the first graph shown describes age differences for tosses made directly to the child's body. Data were collapsed from the two remaining tasks into a single catching condition because of the small amount of data available. The second graph describes age differences for these tasks involving tosses to the head area and various locations to the side.

Hand component

For the hand component, well-defined, age-related modes were not observed when the toss was to the torso of the performer. This pattern is illustrated in Figure 1a, where Level 2 was observed bimodally. In addition, the occurrence of Level 1 declined across groups through 9–10 years, and then increased slightly at age 11–12. In contrast, when the toss was thrown out away from the torso, the expected age-related pattern of increase and decline was observed (see Figure 1b). That is, developmental Level 1 was observed most often in the youngest children, followed by a decline (by 9 years of age, it was rarely seen). The number of trials categorized at Level 2 increased among the youngest three groups and declined in the oldest group observed. Finally, Level 3 was rarely observed in children younger than 11–12 years of age. In general, the results of these analyses suggest the hand component meets the criteria for developmental sequences proposed by Roberton et al. (1980). This was especially true of the analysis of throws to various places around the body. The next step in the validation process, then, would be longitudinal study of the hand component.

Differences in the pattern of results for the two types of catches illustrate the importance of task constraints for categorizing performances of this "simple" catching task. Our subjects appeared to use greater latitude in their performances when the ball was thrown directly to their bodies (see Figure 1a). At least some of the youngest children were able to use a more advanced (Level 2) pattern to catch these balls, as compared to tosses to locations around the body. Additionally, a larger number of trials were categorized at Level 3, even among the 7–10-year-old children, for the direct to torso task. In contrast, some of the older children used a developmentally less advanced hand action to catch balls thrown directly to them. This pattern is seen in the higher incidence of trials categorized at Level 1 (see Figure 1a). Children's ability to track an object may help explain the pattern of performance across the conditions. Ridenour (1974) found balls traveling directly toward the body were perceptually easiest to detect. Because these throws were more easily detected, older subjects may have "played" with the movement. That is, they had more movement options (Halverson, 1971) available for solving the movement problem. On the other hand, throws to various places around the body seem analogous to the maximal conditions under which movement sequences typically are tested. That is, for those conditions, younger subjects were categorized more consistently at lower developmental levels. The highest developmental level was only beginning to be observed among even the oldest subjects tested. These findings are consistent with our hypothesis that tosses to the body are less challenging than those away from the body.

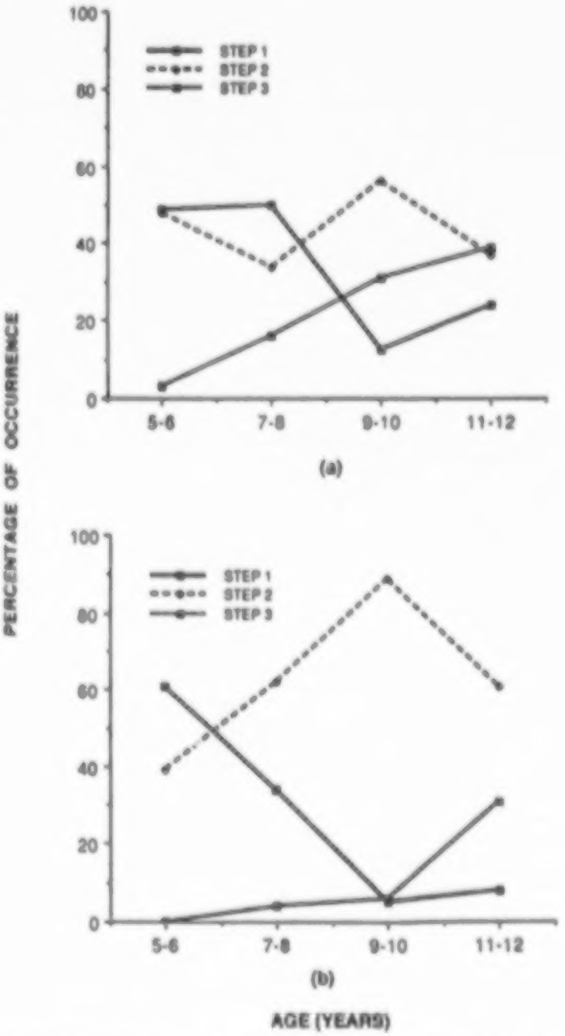

Figure 1. Hand component percentages of occurrence: (a) throws to body, and (b) throws to various locations.

Body component

For the direct-to-torso catching condition for the body component, Levels 1 and 2 followed the general hypothesized pattern (see Figure 2a). Level 1 was observed most often in 5-year-olds; its occurrence declined thereafter. It was never observed modally in the children tested, however. Observing younger or less experienced children might result in a finding of increased incidence. Level 2 was modal in the youngest children and declined thereafter. Nearly 60% of the trials were categorized at Level 2 at 5–6 years of age. No well-defined mode was observed for Level 3. It was modal at 9–10 years, but the pattern of occurrence differed little from Level 4. Finally, Level 4 followed the generally expected pattern of occurrence with increases across the ages tested. However, the same number of trials performed by 5–6-year-olds were categorized at the most advanced level as were placed at the least advanced developmental level. In contrast, few trials were placed at Level 3. This last finding was unexpected, since few of the youngest children would be expected to perform at the most advanced level.

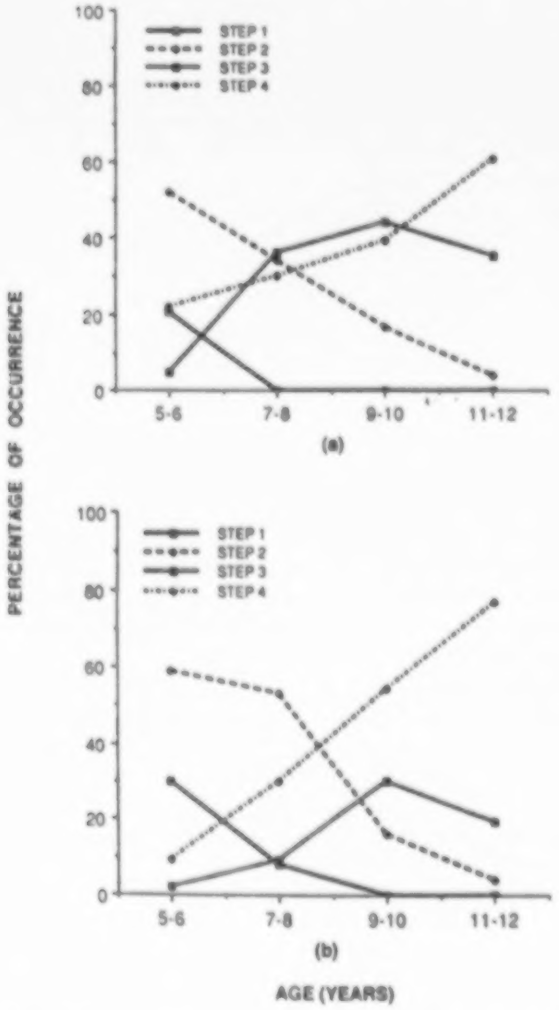

Figure 2. Body component percentages of occurrence: (a) throws to body, and (b) throws to various locations.

The data for tosses to the head and various locations (see Figure 2b) reveal additional problems with this movement component. Levels 1 and 2 follow the same pattern described for the direct-to-torso catches. Level 3 never occurred modally. It increased in incidence across the younger children but declined among the 11–12-year-olds. Level 3 of the body component was added to Harper's original sequences in pilot work. This developmental level, consisting largely of hip flexion used to move into catching position, was observed during pilot work but did not hold up under this additional scrutiny. The action hypothesized as Level 3 was clearly less advanced than that described in Level 4. It may represent a variation of Level 2, where minimal movement of the body occurs (see Table 1). Therefore, it was combined with Harper's original Level 2 (see Table 2). The new revisions (see Figures 3a and 3b) then met the Roberton at al. (1980) criteria for developmental sequences. The revision to the hypothesized sequences resulted in well-defined modes. Level 1 was observed most often in the youngest children and declined with age. Level 2 was modal at about 7–8 years of age, and Level 3 (now the most advanced pattern) increased in occurrence as age increased.

In contrast to finding differences in task constraints for the hand action, note the similarity in the patterns of occurrence for the body component conditions (see Figures 3a and 3b). Our subjects responded

Table 2. Revised steps for the body component

Body Component	
Step 1.	No adjustment of the body occurs in response to the flight path of the ball.
Step 2.	The arms and trunk begin to move in relation to the ball flight path but the head remains erect, creating an "awkward" movement to the ball. The catcher seems to be fighting to remain balanced.
Step 3.	The feet, trunk, and arms all move to adjust to the path of the oncoming ball.

similarly, regardless of task constraints. These results may be related to the mass of the body part described by this movement component. If the torso requires more energy to overcome its inertia than other, smaller body parts (i.e., hands or arms), any of the catching tasks may have been challenging for these subjects. That is, in terms of the action of the torso, these subjects may have used the only movement pattern available to them, regardless of the task constraint. The time needed to determine the placement of the object and to overcome the body's inertia may have left these subjects with little time to adjust the movement.

Arm preparation component

The occurrence of Level 1 in the arm preparation component declined with age when the toss was directly to the body (see Figure 4a). However, Level 2 was modal in the 9–10-year-olds, after Level 3 appeared modally in the 7–8-year-old group. When the toss was to the head or various locations (see Figure 4b), Level 2 was never observed modally. In contrast, Level 1 declined as expected, and Level 3 increased with age, as expected. The failure of the intermediate level (Level 2) to meet the Roberton et al. (1980) criteria calls into question the viability of this sequence. While the "approximate" hypothesized pattern was observed when the tosses were directed to the midline of the subject's body (see Figure 4a), it was not seen for the other catching tasks (see Figure 4b). Additional examination of the arm preparation action may result in a more concise description of component levels. Alternately, it is possible arm preparation actions do not follow age-related patterns of change. Harper's originally hypoth-

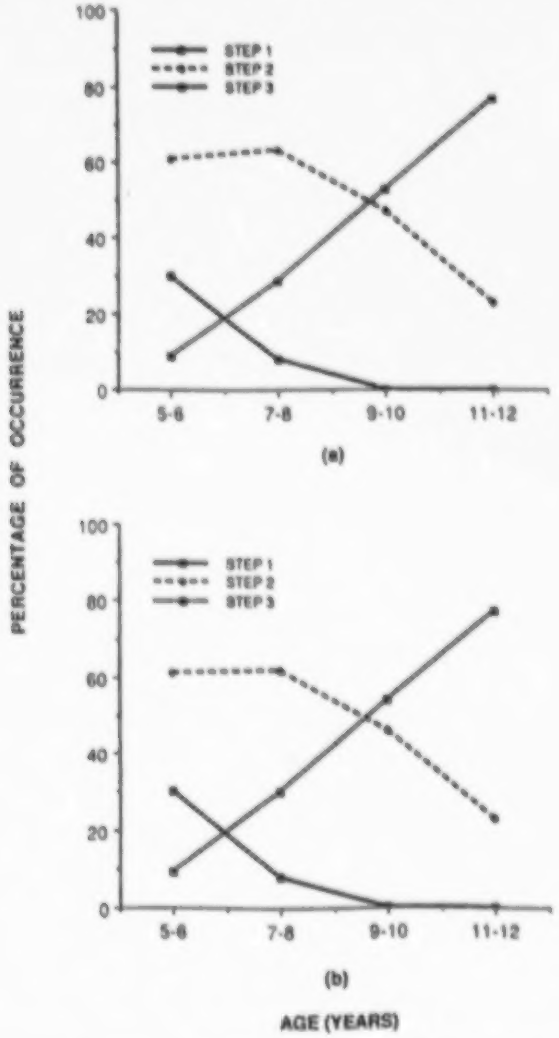

Figure 3. Revised body component percentages of occurrence: (a) throws to body, and (b) throws to various locations.

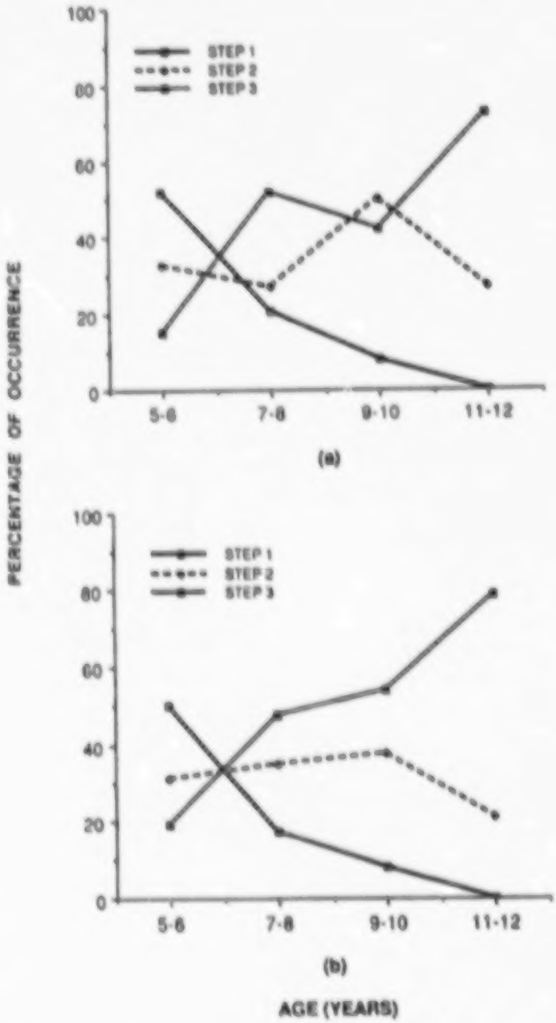

Figure 4. Arm preparation component percentages of occurrence: (a) throws to body, and (b) throws to various locations.

esized sequence, as well as pilot work modifications, divided arm actions into preparation and reception phases. These phases separated different temporal portions of the skill. Our inability to find an age-related pattern of increase and decline in occurrence may suggest the temporal separation was artificial. Additional investigation should examine a combined arm preparation/reception component.

Arm reception component

The occurrence of Levels 1 and 2 in the arm reception component declined in parallel when the toss was directed to the torso (see Figure 5a). Level 3 was modal for 7–12-year-olds. Contrary to what was hypothesized from the Roberton et al. (1980) model, its occurrence did not decline in older children. Level 4 increased in incidence after 5–6 years but was never modal. The occurrence of Level 5 increased with age and exceeded the incidence of Level 4 in the 7–8-year-olds. These results illustrate two deviations from the pattern of results hypothesized by Roberton et al. for valid developmental sequences. First, the close relationship between Levels 1 and 2 suggests they may describe a similar behavior. The similarities in pattern among Levels 3–5 also suggest they may describe similar action..

Additional evidence that Levels 1 and 2 characterize the same behavior is apparent from the data for tosses to the head and various locations (see Figure 5b). The pattern of occurrence is parallel across the ages tested, as was seen when tosses were to the body. Level 3 was observed modally in the 7–8-year-old children, but the difference in percentage of occurrence between Levels 3 and 4 is negligible. While hypothesized differences between Levels 3 and 4 were small, the ordering was appropriate. Levels 4 and 5 most closely followed the Roberton et al criteria. Level 4 increased in occurrence to 9–10 years of age and declined thereafter. Level 5 increased gradually across the ages tested. Although Level 5 was never observed modally, its steady increase suggested it would like appear more often in older subjects.

The importance of task constraints for this "simple" catching task was illustrated in the arm reception component. Subjects appeared to have greater latitude in their performances when the ball was thrown directly to their bodies (see Figure 5a). Some of the youngest children were able to use more advanced patterns to catch. In particular, Level 5, the most advanced level, occurred more often than expected among most age groups for the direct-to-torso condition. Even 7–8-year-olds had nearly one third of their trials categorized at Level 5. Level 3 occurred most often among 7–12-year-olds when throws were made to the torso (see Figure 5a); Level 4 occurred more often for throws to other locations.

Close scrutiny of the two throwing conditions suggests subjects performed at higher developmental levels when balls were thrown to the body. They tended to use less advanced patterns when tosses were thrown away from the torso. This pattern is suggested by the relatively high occurrence of Levels 3 and 5 among 7–8-year-olds when throws were made to the body (see Figure 5a). In contrast, the occurrence of Level 5 fell when throws went to various locations. Simultaneously, the percent of trials categorized at Level 4 increased (see Figure 5b). A similar pattern was observed among older subjects. The occurrence of Level 5 decreased when tosses were made to various locations, as compared to tosses made to the body. Most trials performed

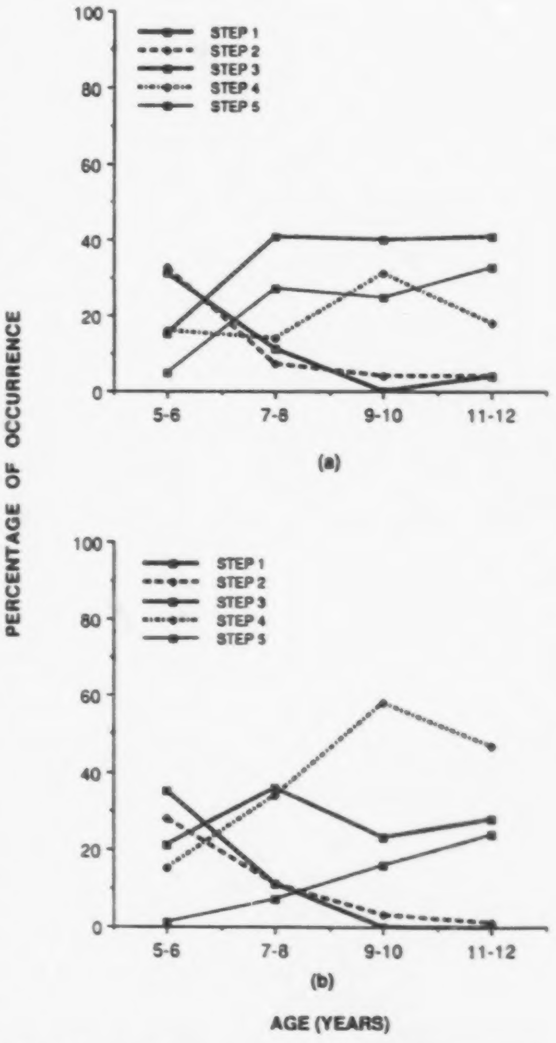

Figure 5. Arm reception component percentages of occurrence: (a) throws to body, and (b) throws to various locations.

by older children were categorized as Level 4 in the tosses made to various locations. These results again suggest tosses to the body were more easily caught than tosses to other locations. The pattern of results was similar to that observed for other movement components. That is, younger subjects apparently "regressed" when faced with what seemed to be "more challenging" catching conditions. In contrast, some older subjects may have "played" with the way they responded. They could used less advanced catching patterns when throws were made to less challenging locations but used or possibly had to use more advanced patterns when they were "more challenged."

General Discussion

There were two primary purposes for this investigation. The first was to begin a systematic examination of task demands on the performance of a fundamental motor skill, the two-handed catch. Second, we began a preliminary, cross-sectional validation of previously hypothesized developmental sequences. It is not possible to discuss our findings for these two purposes independently. The apparent validity of the sequences was clearly dependent on specific task conditions—for some components our conclusions would have differed dramatically had we tested subjects under a single condition. That is, task constraints had a bearing on how subjects were categorized.

Kelso and Schoner (1988) suggested constraints or environmental variables provide the shape of an action. Results of our investigation illustrate this point. There were clear differences in how subjects performed when they were tested under the two separate conditions. Younger children often performed using more advanced developmental levels when tosses were made to their bodies. In contrast, they were characterized by less advanced patterns when tosses were to locations around them. These data support the hypothesis that tosses directed to the torso would provide minimal challenge. Tosses directed to various locations around a subject's body were more challenging. Whether this was due to perceptions, overcoming inertia, or experience is not known. Further investigation is need to answer this question.

Previous investigators hypothesized environmental variables were critical to task performance (DuRandt, 1985; Halverson et al., 1973; Herkowitz, 1978). Little systematic study of the influence of the environment on task performance or outcomes has been generated. Based on the theoretical work of researchers like Bernstein (1967) and Kelso and Schoner (1988), investigators have begun a search for differences in biomechanical variables underlying movement. Experimenters have examined specific environmental influences, like task demands (Clark, Phillips, & Petersen, 1989). These experimenters looked at underlying patterns of coordination (e.g., Clark et al., 1989); Kelso & Schoner, 1988). The current investigation demonstrates the overt configuration of an action is influenced by task demands as well.

It is important to recognize the nature of any constraint is nonspecific and nonprescriptive (Kelso & Schoner, 1988; Thelen, 1986). In other words, changes in the location of a toss will not result in precisely predictable changes in catching pattern. Rather, the pattern may not change in any dramatic fashion in relation to small changes in task demands. When a certain critical point is reached, however, a dramatic change in performance will occur. This characteristic of task constraints was not specifically examined in this investigation. Clear pattern differences were observed as performers shifted from one task to another. In addition, for at least one component (arm reception), there were age differences in the nature of the change. Investigation of additional conditions would be necessary to ascertain the point at which a shift (to lower or higher developmental level) occurred. Future research should focus on identifying where subjects shift from one level of performance to another. Additionally, examining subjects at different ages will be necessary to determine the influence of development on task performance.

One final point should be considered. The task studied here, the two-handed catch, represents a different type of movement skill from those examined in most other investigations of developmental changes. At the least, catching is a task requiring the *reception* of an object, while studies of throwing, jumping, and the like have examined *projection* skills. This difference is important since in the performance of projection skills, the mover controls the amount of forward movement made (self-determines the amount of "effort" expended, for example). On the other hand, reception tasks force the performer to rely more heavily on "external" factors that may dictate the level of success. Performers must respond more directly to environmental requirements. For example, where the object is thrown or how it is thrown may have a large impact on performance.

Other investigators (particularly Alderson, Sully, & Sully, 1974) have described two phases for the catching action: a positioning phase (arms and hands are moved into position) and a grasping or shaping phase (fingers close to grip the object). The movement components described in this investigation can be placed into each of these phases. Clearly, the hand component deals with the grasp phase of the action. Both arm components represent the positioning phase of catching. The body component may have elements of both shaping and positioning phases. It is interesting that those movement components related to the positioning phase were the ones for which support was weakest, whereas the shaping components were supported. As we continue to examine age- and task-related changes in catching, attention should be paid to these two phases of catching.

In summary, we think sufficient evidence is presented to encourage further longitudinal validation of developmental sequences for the hand component and revised body component for catching a small ball. Arm reception and arm preparation components require additional modification before continuing with the validation process. Levels 1 and 2 of the arm reception sequence need at least definitional refinement prior to longitudinal study. Arm preparation may need further definitional refinement, but the problems with this component go beyond this relatively simple solution. Combination of the two-arm component temporal phases may be necessary to meet the criteria for developmental sequences sugested by Roberton et al. (1980).

We also demonstrated the impact differing task demands have on the performance of a fundamental motor skill. If the situation is relatively nonchallenging for developmentally advanced performers, they may have choices in the pattern they use. In contrast, those subjects not yet functioning at higher levels of development may have fewer performance options, regardless of specific tesk requirements. Additional study is necessary to determine more broadly what constrains performance of fundamental movement skills, as well as specific influences of those constraints.

References

Alderson, G., Sully, D., & Sully, H. (1974). An operational analysis of a one-handed catching task using high speed photography. *Journal of Motor Behavior*, 6, 217-226.

Bernstein, N. (1967) *The coordination and regulation of movement*. Oxford: Pergamon Press.

Clark, J., & Phillips, S. (1985). A developmental sequence of the standing long jump. In J. Clark & J. Humphrey (Eds.), *Motor development: Current selected research* (pp. 73-85). Princeton, NJ: Princeton Book Co.

Clark, J.E., Phillips, S. & Petersen, R. (1989). Developmental stability in jumping. *Developmental Psychology*, 25, 1029-1035.

DuRandt, R. (1985). Ball catching proficiency among 4-, 6-, and 8-year old girls. In J. Clark & J. Humphrey (Eds.,), *Motor development: Current selected research* (pp. 35-44). Princeton, NJ: Princeton Book Co.

Halverson, L.E. (1971). The significance of motor development. In G. Engstrom (Ed.), *The significance of the young child's motor development* (pp. 17-33). Washington, DC: National Association for the Education of Young Children.

Halverson L.E., Roberton, M.A., & Harper, C. (1973). Current research in motor development. *Journal of Research and Development in Education*, 6, 56-70.

Halverson, L.E. Roberton, M.A., & Langendorfer, S. (1982). Development of the overarm throw: Movement and ball velocity changes by seventh grade. *Research Quarterly for Exercise and Sport*, 53, 198-205.

Harper, C.J. (1979). Learning to observe children's motor development. Part III: Observing children's motor development in the gymnasium. Paper presented to the national convention of the American Alliance for Health, Physical Education, and Recreation, New Orleans.

Herkowitz, J. (1978) Developmental task analysis: The design of movement experiences and evaluation of motor develpment status. In M.V. Ridenour (Ed.), *Motor development: Issues and application* (pp. 139-164). Princeton, NJ: Princeton Book Co.

Isaacs, L.D. (1980). Effects of ball size, ball color, and preferred color on catching by young chidlren. *Perceptual and Motor Skills*, 51, 583-586.

Jenkins, L. (1930). *A comparative study of motor achievements of children five, six, and seven years of age*. New York: Teachers College, Columbia University.

Kelso, J.A.S., & Schoner, G. (1988). Self-organization of coordinative movement patterns. *Human Movement Science*, 7, 27-46.

Morris, G.S.D. (1976). Effects ball and background color have upon the catching performances of elementary school children. *Research Quarterly*, 47, 409-416.

Poe, A. (1976). Description of the movement characteristics of two year old children performing the jump and reach. *Research Quarterly*, 47, 260-268.

Ridenour, M.V. (1974). Influence of object size, speed, and direction on the perception of a moving object. *Research Quarterly*, 45, 293-301.

Roberton, M.A. (1977). Stability of stage categaorizations across trials: Implications for the "stage theory" of overarm throw development. *Journal of Human Movement Studies*, 3, 49-59.

Roberton, M.A. (1978). Longitudinal evidence for developmental stages in the forceful overarm throw. *Journal of Human Movement Studies*, 4, 167-175.

Roberton, M.A. (1987). Developmental level as a function of the immediate environment. In J.E. Clark & J. Humphrey (Eds.), *Advances in motor development research, 1* (pp. 1-16). New York: AMS Press.

Roberton, M.A., & Halverson, L.E. (1984). *Developing children: Their changing movement*. Philadelphia: Lea & Febiger.

Roberton, M.A., & Halverson, L.E. (1988). The development of locomotor coordination: Longitudinal change and invariance. *Journal of Motor Behavior*, 20, 197-241.

Roberton, M.A., Williams, K., & Langendorfer, S. (1980). Prelongitudinal screening of motor development sequences. *Research Quarterly for Exercise and Sport*, 51, 224-231.

Thelen, E. (1986). Development of coordinated movement: Implications for early human development. In M.G. Wade & H.T.A. Whiting (Eds.), *Motor development in children: Aspects of coordination and control* (pp. 107-124). Dordrecht, Netherlands: Martinus Nijhoff.

Williams, K. (1980). The developmental characteristics of a forward roll. *Research Quarterly for Exercise and Sport*, 51, 703-713.

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Catching Performance: Implications for the Practitioner

Larry D. Isaacs

To experience success in many elementary school games, a child must demonstrate some proficiency in the fundamental skill of catching. It has been estimated that approximately one-third of the activities suggested in elementary physical education textbooks and curriculum guides involve games which require ball retrieval skills (Pederson, 1973).

For many years, researchers have attempted to identify various factors that may have an effect on young children's catching ability. The purpose of this article is to review this research and bring to light those factors which have been found to influence the task of catching. In addition, practical implications drawn from this research are offered to the practitioner.

Ball Size

The effects of ball size[1] on one's catching ability have received much attention. Research conducted in the latter half of this century has suggested the use of large balls as a means of enhancing the catching performances of young children (McCaskill & Wellman, 1938; Warner, 1952). Such recommendations have been made on the premise that (1) primary school aged children are farsighted and the use of a large ball may enhance visual tracking (Smith, 1970) and (2) from a neurological standpoint the young child has not acquired the fine motor control needed to grasp a small object.

For the most part, earlier studies evaluated the individual's catching attempts on a pass-fail basis; either the child retained the ball or did not retain the ball. Thus the maturity level or refinement of the task was not taken into account. Since the introduction of weighted rating systems and film analyses which are capable of measuring the degree of refinement of each catching attempt, the literature is no longer as precise. In fact, a recent investigation found a linear relationship between ball size and degree of refinement of a catching attempt (Isaacs, 1979). More specifically, as the diameter of the ball increased, the children tended to resort to a more primitive style of catching. These findings have also been supported by Victors (1961).

Research also suggests that larger balls are more likely to cause children to exhibit fear reactions to the projectile than are smaller balls. Such negative reactions to the tossed ball include head turning, a backward lean away from the ball, and a closing of the eyes (Deach, 1950). Seefeldt (1972) noted such fear reactions in children four through six years of age but no such negative reactions to a projectile were observed in younger children (one and one-half to three years). This finding lead him to speculate that fear of the projectile may be a conditioned response due to earlier failures at the task and not a natural phenomenon.

Implications. Research strongly indicates that the use of large balls tends to encourage *less* than mature styles of catching (traps, body assisted). Even though the large playground ball does have a place in the elementary physical education curriculum, it appears that when the primary purpose of the lesson is to teach the skill of catching, then the smaller sized balls should be utilized in an attempt to elicit more mature responses. In addition, the skill of catching is difficult enough without the child having to worry about being injured by the projectile. The use of a smaller and softer ball may aid the child in feeling more comfortable about the task.

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[1] Research has not established a standardized range of measurements for classifying balls as being large or small. Due to differences in body size a large ball for some individual may be a small ball to another. The teacher will need to evaluate each situation individually to determine the appropriate ball size classification.

Ball and Background Color

The simple main effect that ball color has on one's catching ability is questionable (Isaacs, 1979; Schoney, 1973). However, it has been suggested that manipulation of *both* ball color and background color may be one means of improving skill performance (Gavnishy, 1970; Ghosh, 1973). In studying the effects of ball and background color on the catching performances of young children, Morris (1976) found that both blue and yellow balls were caught significantly better than white balls. Furthermore, the children's highest catching scores were obtained when the blue balls were projected against a white background.

Implications. Providing a good contrast between ball and visual background noise should aid the child in the visual operations of differentiating between the appropriate display (ball) and irrelevant or secondary displays (background). In addition, the background from which the ball is projected should be kept simple. Teaching young children catching skills on the playground where the background may consist of passing cars and/or the movement of others playing may complicate the task even for a skilled adult performer.

Preferred Color

Data obtained in a recent investigation by Isaacs (1979) indicated that a child's preferred color may also be an influential factor in children's catching performances. Prior to administering a criterion catch test, subjects were required to choose their favorite colored ball. Results of this study indicated that irrespective of ball color, both the boys and girls tended to catch their preferred colored ball significantly better than their nonpreferred colored balls.

Motor development research suggests that the purpose of viewing a projectile is to gather sensory information concerning the changing flight characteristics of the projectile—both spatially and temporally (Whiting, 1971). However, with very young children and children who have had little experience in ball retrieval skills, it is likely that the child is not focusing enough of his/her attention on the appropriate display (ball). The psychological literature has suggested that color may be one means by which we can increase selective attention to a stimulus, in this case a thrown ball. One can speculate that the children in this study focused their selective attention to the ball for a longer period of time when catching their preferred colored ball and were therefore able to obtain more critical information concerning the ball's flight. This additional information may have contributed to the higher catching scores.

Implications. Since the children caught their preferred colored ball better than nonpreferred colored balls, the teacher may not want to randomly assign a particular ball color to a child. Instead the teacher may want to consider allowing the child to choose the ball color with which he/she would most want to play. Obviously, more research needs to be conducted before any concrete suggestions can be offered. However, taking into consideration a child's preferred color maybe another means of enhancing catching performance.

Ball Velocity

Ridenour (1974) has determined that ball speed is an influential factor in children's ability to accurately predict the direction in which a projectile is moving. While subjects in her study were not required to catch the ball, it can be generalized that prediction of object directionality is necessary in a catching task. In a follow-up study involving actual interception of an object (striking a ball), ball speed was once again found to be an important factor (Ridenour, 1977). In this case the children generally performed better when the balls were moving at the slower speed. The second, fourth, and sixth grade children in Bruce's (1966) investigation were required to actually catch balls which were projected at two different speeds (25 ft/sec. and 33 ft/sec.). Results indicated that the catching performances of both the second and fourth grade children declined as ball speed increased.

Implications. In presenting catching skills to young children the teacher may frequently pair-up the students requiring them to throw the ball to one another so that each may practice the catching task. Due to the inexperience of the young thrower the teacher usually places the children only a few feet from one another. As a result of this teaching formation, the balls are generally thrown at a pace which the children cannot handle. The use of various projectiles which by nature move more slowly than a traditional ball may be one answer. Such objects include yarn balls, nerf balls, sponge balls, and whiffle balls. Still better, the children can catch balls which they have thrown against a wall. Not only will the velocity of the balls be less, but also this strategy allows the child to concentrate on the catching task as opposed to placing most of his/her efforts in directing the ball to a partner (throwing task).

Adjustive Movements

A majority of the researchers whose studies have been cited in this article have required their subjects to catch balls which were projected directly toward the body's midline. However, declines in children's catching performances have been noted when the balls were projected away from the performer (Pedersen, 1973). Thus catching appears to be more difficult if the child is required to move forward-backward or left-right to catch a ball.

Implications. Once again the teacher needs to be careful in how he/she organizes the learning environment. If children toss to one another, it is highly probable that the thrower does not possess enough accuracy to consistently throw the ball directly to his/her partner. The use of ball machines, adult tossers, or specially constructed ramps (similar to a sliding board in which the ball can be rolled down) will provide a more consistent toss for the child to catch.

Trajectory Angle

Variations in trajectory angles were a major feature in Bruce's (1966) investigation of catching behaviors of second, fourth, and fifth grade children. The balls were projected at either a 30 degree or 60 degree angle. An analysis of the data indicated that angle of projection did not significantly affect one's catching ability. On the other hand, Williams (1968) utilized nine skilled and nine unskilled catchers in an attempt to determine the effects of trajectory angle on speed and accuracy of judging a moving object. Results of her study indicated that the unskilled catchers performed better when balls were projected at a 34 degree angle, whereas the group as a whole performed better when the balls were projected at a 44 degree angle.

Implications. It is generally accepted that children are more successful in first visually tracking objects which move in a horizontal plane than they are with tracking objects moving in a vertical plane. Therefore it would appear that activities which frequently result in the projectile moving in a path similar to what one would term a "pop-fly" or "pop-up" would increase the difficulty of the catching task.

Summary

This article has examined some of the pertinent factors which have been found to influence the catching performances of young children. To facilitate clarity of discussion each factor has been presented independently of other factors. The teacher should, however, be aware that research indicates that these factors actually interact with one another. Taking into consideration the research findings and practical suggestions offered, the creative teacher should be in a better position to construct a learning environment conducive to the teaching of catching skills to young children.

References

Bruce, R.D. The effects of variation in ball trajectory upon the catching performance of elementary school children. Unpublished doctoral dissertation, University of Wisconsin, 1966.

Deach, D. Genetic development of motor skills in children two through six years of age. Unpublished doctoral dissertation, University of Michigan, 1950.

Gavnishy, B. Vision and sporting results. *Journal of Sports Medicine and Physical Fitness*, 10 (December 1970), 260-264.

Ghosh, A. Ocular problems in athletics: Role of ophthalmology in sports medicine. *Journal of Sports Medicine and Physical Fitness*, 13 (June 1973), 111-118.

Isaacs, L.D. The effects of ball size, ball color and preferred color on the catching ability of 7- 8 year old boys and girls. Unpublished doctoral dissertation, University of Maryland, 1979.

McCaskill, C.L., & Wellman, B.L. A study of common motor achievements at the preschool ages. *Child Development*, 9 (June 1938), 141-150.

Morris, G.S.D. Effects ball and background color have upon the catching performance of elementary school children. *Research Quarterly*, 47 (October 1976), 409-416.

Pedersen, E.J. A study of ball catching abilities of first, third, and fifth grade children in twelve selected ball catching tasks. Unpublished doctoral dissertation, Indiana University, 1973.

Ridenour, M.V. Influence of object size, speed, and direction on the perception of a moving object. *Research Quarterly*, 45 (October 1974), 293-301.

Ridenour, M.V. Influence of object size, speed, direction, height, and distance on interception of a moving object. *Research Quarterly*, 48 (March 1977), 138-143.

Schoney, M.H. The effects of varying color and direction of projection on the catching performance of 8.5 to 11.5 year old boys and girls. Unpublished master's thesis, Purdue University, 1973.

Seefeldt, V. Developmental sequence of catching skill. Paper presented at AAHPER Meeting, Houston, 1972. Cited in R.L. Wickstrom, *Fundamental motor patterns* (2nd ed.). Philadelphia: Lea & Febiger, 1977.

Smith, H. Implications for movement education experiences drawn from perceptual-motor research. *Journal of Health, Physical Education, Recreation*, 41 (April 1970), 30-33.

Victors, E.E. A cinematographical analysis of catching behavior of a selected group of seven and nine year old boys. Unpublished doctoral dissertation, University of Wisconsin, 1961.

Warner, A.P. The motor ability of third, fourth, and fifth grade boys in the elementary school. Unpublished doctoral dissertation, University of Michigan, 1952.

Whiting, H.T.A. *Acquiring ball skills: A psychological interpretation*. Philadelphia: Lea & Febiger, 1971.

Williams, H.G. The effects of systematic variation of speed and direction of object flight and of skill and age classification upon visuo-perceptual judgements of moving objects in three-dimensional space. Unpublished doctoral dissertation, University of Wisconsin, 1968.

"Show and Tell" in the Gymnasium Revisited: Developmental Differences in Modeling and Verbal Rehearsal Effects on Motor Skill Learning and Performance

Maureen R. Weiss, Vicki Ebbeck, and Debra J. Rose

Little research has investigated the observational learning process from a developmental perspective. The purpose of this study was to extend previous research by considering two factors: performance versus learning and sequencing versus form scores. Children (N = 60) comprising two age groups (5-0 to 6-11) and 8-0 to 9-11 years) were randomly assigned to verbal rehearsal only, model only, or model plus verbal rehearsal conditions. The task was a 6-part motor skill sequence in which proper sequencing and quality of form were assessed. A 2 x 3 x 4 (age group by model type by trial blocks) repeated measures MANOVA revealed a significant three-way interaction. Older children performed equally well under any of the model type conditions during both performance and learning. For younger children, a model plus rehearsal was superior to rehearsal only on sequence and form at performance and learning and superior to model only on sequence scores during the first two performance trial blocks. Model only and model plus rehearsal conditions were equally effective on form scores. These results suggest that age differences exist in the modeling of motor skills under conditions varying in model type, sequence and form scores, and performance and learning phases.

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Anyone who has ever attempted to teach sport skills such as a basketball lay-up, a tennis backhand, or an overhand volleyball serve to children understands the crucial role visual demonstrations play in performance and learning. Most sport skills are not easily described in words or verbal instructions only, nor is this mode of information easily retained and translated to action by observers. Invariably, the predominant teaching mode in these cases is to say, "Watch how I do it," and to depict visually how the component skills are to be coordinated into a flowing movement. Because visual information is such a powerful means of conveying information about sport skills in particular, modeling is one of the most important instructional strategies for broadening the physical skill repertoire of children and adolescents.

Bandura's (1977, 1986) social learning/social cognitive theory of modeling has been the prominent framework within which sport skill acquisition has been studied over the years (Gould & Roberts, 1981; McCullagh, Weiss, & Ross, 1989). According to Bandura, modeling serves as an information vehicle whereby observers glean salient information conveyed through visual and/or verbal demonstrations. This information is symbolically coded by the observer in imaginal or verbal form, and these encoded bits of information are later used to translate thoughts into action. More specifically, Bandura contends that four constituent subprocesses are essential for modeling to occur: attentional, retentional, production, and motivational. The attentional subprocess requires that observers selectively attend to the salient features of the modeled act that will lead to successful reproduction of the skills. The retentional subprocess suggests that individuals must actively rehearse, symbolically code, and organize visual information conveyed by models in order to commit this information to long-term memory. The production subprocess represents the need for observers to have the physical capabilities and knowledge base for cognitive representations of the modeled act to be successfully translated into motor reproduction. Finally, the motivational subprocess necessitates that observers have the desire and interest to emulate modeled events, whether these events are derived from self-initiated or external incentives.

A substantial amount of research investigating the relationship between modeling and motor performance has supported Bandura's theoretical formulations (McCullagh et al., 1989). For example, the efficacy of attentional mechanisms (McCullagh, 1986; Weiss, 1983), retentional capabilities (Weiss & Klint, 1987), motor reproduction skills (Feltz, 1982), and motivational requirements (Gould & Weiss, 1981; Little & McCullagh, 1989) for producing modeling effects on motor behavior have been demonstrated. While Bandura's social cognitive theory has been paramount in the literature, surprisingly few studies have examined developmental factors related to children's modeling of motor skills. Perhaps this can be attributed to the fact that only recently has Bandura (1986) addressed developmental differences that might mediate the four component subprocesses. However, Yando, Seitz, and Zigler (1978), a group of developmental psychologists, consolidated aspects of several theories of modeling to focus on the developmental differences evidenced in selective attention, memory capability, coding strategies, physical skills, and motivational orientation. As a result of these researchers' influence, developmental modeling effects on sport skill learning has become a recent topic of interest in the motor behavior literature (McCullagh et al., 1989).

To date, only a few studies have examined the effects of modeling in the physical domain from a developmental perspective (McCullagh, Stiehl, & Weiss, 1990; Thomas, Pierce, & Ridsdale, 1977; Weiss, 1983; Weiss & Klint, 1987). In an early investigation, Weiss (1983) found that modeling effects on motor performance depended on both the age of the observer and characteristics of the model. Specifically, younger children (ages 4-0 to 5-11 years) achieved better motor performance and attentional ratings when exposed to a "show and tell" model who verbalized task components while visually presenting them in comparison to a silent model who only visually demonstrated the skills or a no model control group that only received verbal instructions on what skills to perform sequentially. However, older children (ages 7-0 to 8-11 years) performed equivalently with a verbal or silent model and significantly better than the no model control group.

To further investigate the role of model type in children's motor performance, Weiss and Klint (1987) assigned younger and older children to verbal model or noi model conditions, and these were combined with verbal rehearsal or no verbal rehearsal of a 6-part motor skill sequence. In contrast to Weiss (1983), only a rehearsal main effect was found that revealed that verbal rehearsal groups (both verbal model and no model) performed the sequence of skills significantly better than the no verbal rehearsal conditions; this was true for both age groups. Qualitative findings revealed that older children were more likely to adopt effective strategies for remembering the skill sequence such as mental rehearsal, verbal self-instruction, and verbal repetition, whereas younger children did not overtly express similar rehearsal techniques.

McCullagh et al. (1990) randomelyh assigned girls 5-0 to 6-6 and 6-6 to 8-11 years of age to conditions within a model type (verbal model, no model) by verbal rehearsal (rehearsal, no rehearsal) design using a 5-part dance skill sequence. Dependent variables included both sequence and form scores as a function of both performance and immediate transfer trials. Results revealed that older children performed significantly better than younger children on both quantitative and qualitative assessments but an age by model type interaction was not found. Instead of model type main effect indicated that the no model condition (verbal instructions only) was sufficient for producing superior sequencing scores, whereas children in the verbal model condition recorded significantly higher form scores. The authors concluded that task type (e.g., free vs. serial recall) may interact with type of instructional strategy (e.g., visual vs. verbal) to maximize learning and performance effects.

These few developmental modeling studies are characterized by some inconsistencies concerning the effectiveness of silent and verbal models on children's motor skill performance. The equivocal findings may be considered in the context of a recent review article by McCullagh et al. (1989) that has identified several factors as critical to the modeling process in the acquisition and performance of motor skills. They consolidated the previous theory and research pertaining to modeling in the physical domain into a heuristic framework for understanding the integrative nature of modeling influences. Specifically, they proposed that characteristics of the observer (e.g., cognitive-developmental factors, knowledge base) interact with characteristics of the demonstration (e.g., silent/verbal model, augmented information) to influence behavioral responses. Moreover, performance-related responses were discussed in relation to two important issues: (a) outcome versus process measures, and (b) learning versus performance effects.

Little research to date has distinguished modeling differences attributed to process and outcome indicants of performance. The majority of studies have employed outcome measures such as time elapsed, correct sequencing, and number or percentage of skill parts performed correctly. Similarly, few studies have contrasted immediate performance with the learning effects of modeling by employing an appropriate retention or transfer design. Thus, it is not known whether modeling strategies have temporary or more enduring effects on skill performance. To determine the effectiveness of modeling on motor skill performance, it appears that both process and outcome and learning and performance indices should be assessed.

McCullagh et al. (1990) did implement outcome and form, as well as performance and transfer trials in their research design but only found age and model type main effects. Some possible explanations for their lack of an age by model type interaction include the discrete measures of sequence and form (0, 1, or 2) used, the one-trial verbal rehearsal of the skill sequence, and the use of immediate rather than delayed transfer trials. The Weiss and Klint study, in contrast, was characterized by two factors that typify developmental modeling research: (a) the sequence of skills employed in the demonstration represented an indicant of performance outcome, not form; and (b) only immediate performance, not skill learning, was measured. Thus, Weiss and Klint may have found cognitive-developmental differences in response to the combination of model type and verbal rehearsal conditions if both motor skill sequence and form, as well as performance and learning trials, were considered.

The purpose of the present study was to replicate and extend Weiss and Klint (1987) in two important ways. First, motor performance and learning effects were investigated in relation to modeling and verbal rehearsal of motor skills. To do this, both initial acquisition trials and a 2-day retention test were employed to determine whether modeling effects were short-lived or more enduring in nature. Second, both quantitative (sequencing) and qualitative (form) aspects of performance were assessed. To do this, children were required to reproduce both the correct order of demonstrated motor skills, as well as unique qualities of motor skill form expressed by the model when producing these particular skills.

Children comprising two age groups were randomly assigned to three instructional conditions: verbal model only, verbal model plus verbal rehearsal, and verbal rehearsal only. Based on developmental and social-cognitive theories of modeling (Bandura, 1986; Yando et al., 1978) and previous developmental modeling research, it was hypothesized that (a) for younger children a verbal model plus verbal rehearsal will be superior on sequence and form scores for learning trials only, but for older children no significant differences will exist among model type groups for performance or learning; and (b) both younger and older children will exhibit significantly better form performance with exposure to either a model only or a model combined with verbal rehearsal.

Method

Subjects and Design

The sample was comprised of 60 girls who were drawn from a university-sponsored summer sports program. As in Weiss and Klint (1987), the age groups chosen for this study were 5-0 to 6-11 ($M = 6.49$ yers.) and 8-0 to 9-11 years ($M = 9.20$ yrs.). Each age group consisted of 30 children. These age groups were chosen based on the cognitive developmental literature depicting informational processing and memory strategy differences (Gallagher & Hoffman, 1987; Thomas, French, Thomas, & Gallagher, 1988). Children were randomly assigned to model type conditions within a 2 x 3 x 4 (age group by model type by trial blocks) mixed factorial design.

The model type independent variable included three variations of modeling combined with verbal rehearsal. A verbal model only condition consisted of the child viewing a show and tell model who demonstrated the task sequence while concurrently verbalizing the skills as the model performed. A verbal model plus verbal rehearsal condition additionally required that the child recite aloud the correct order of the skill sequence after viewing the demonstration before performance trials began. Finally, the verbal rehearsal only condition was one in which the child did not see a visual demonstration but rather received verbal instructions only on what skills to perform and in what order. Following verbal instructions, the child then engaged in the verbal rehearsal procedure. A pure control group (no model, no rehearsal) was not used in this study due to the consistent findings in previous studies that this group performs significantly lower on a skill sequence task (Weiss, 1983; Weiss & Klint, 1987).

The trial blocks independent variable included both performance and learning trials for all subjects. Children executed six performance trials following exposure after every two trials to the experimental protocol associated with their assigned condition. Two days later, children returned and performed three learning trials without the benefit of instructions, modeling, or rehearsal procedures. Performance scores were averaged for every two trials to produce three trial blocks, and a learning score was computed by averaging three trials to produce one trial block. For all subjects, then, four trial blocks (three performance and one learning) were used in subsequent analyses.

Task

The task employed in the present study was the identical 6-part motor skill course used in the Weiss and Klint (1987) study. The component skills required for reproduction by the children were a crab walk, hop, elephant walk, gallop, log roll, and skip. Also in accordance with the task a beanbag was picked up after the hop and dropped after the gallop at the appropriate mat. Children were required to perform these fundamental skills in a specific sequence, a procedure similar to that in Weiss and Klint. In addition to emulating the correct sequence of skills, children were also told that they were required to reproduce specific elements of form that were identifed for each task component. This was required in order to obtain a measure of "quality of performance." Two unique elements of form were identified for each skill. The skills and their unique elements were as follows:

crabwalk—*execute backward, eyes looking up to ceiling*
hop—*on left foot, both arms extended horizontally*
elephant walk—*arms swinging past line of body, eyes looking down at floor*
gallop—*right foot leads, back foot does not cross over*
log roll—*hands clasped over head, straight line roll to opposite mat*
skip—*exaggerated knees and arms swinging.*

To accurately document both sequence and form scores for each component skill, children's performances on all trials were videotaped and later reviewed by two independent raters.

For each skill and each trial, form scores were computed on a scale from 0 (did not do the skill at all) to 5 (perfect form). A score of "1" was awarded if the skill component was executed but neither of the form elements were evident (e.g., skip: knees were kept close to ground, no arm swing); a "2" characterized performance of a skill where one of the two elements was partially executed (e.g., hop: right foot, arms held away from body but not horizontally); a "3" indicated that one of the two form elements was performed correctly; and a "4" indicated that one element was performed correctly while the other form element was partially attempted (e.g., crabwalk: backward, eyes directed toward ceiling only part of the way to the next station). A composite score was computed for each trial that could range from 0 to 30, and performance and learning trials were blocked into four segments. An *average* score ranging from 0 to 30 was then computed for every two performance trials and an *average* score of 0 to 30 for learning trials. Thus, each subject had average form scores (0 to 30) for three blocks of performance trials and an average form score (0 to 30) for the block of learning trials.

Two independent raters who were familiar with children's motor skill development served as independent raters for determining form scores. They were asked to view videotapes of each subject's performance and learning trials and record a form score for each motor skill. These individual form scores were then summed across motor skills to produce a form score for each trial. Prior to recording form scores, however, both of the raters underwent a systematic training program. First, the primary objective of the study was fully explained to the raters, but they were not made aware of the experimental conditions assigned to the children they observed on the videotape. Second, the qualitative rating procedure for each component skill and the criteria for assigning partial or full credit for modeling form were described fully. Third, six subjects were reviewed as a group to ensure consistency of assigning form scores and to address any additional questions raised by the raters. Fourth, the raters independently scored 12 subjects, 4 of which were evaluted at two separate times, and these scores were used for calculating both inter- and intrarater reliabilitry. Inter- and intrarater reliabilities were determined by computing correlation coefficients between as well as within the two raters. These values were r = .95 for interrater reliability and r = .89 and .97 for intrarater reliability. Subsequently, the remainder of the subjects were equally divided among the two raters, as well as 10 common subjects, for recording form scores for both performance and learning trials. In all, then, the raters evaluated 22 of the same subjects, and interrater reliability was .82.

In contrast to the form scores, quantitative scoring of the task centered on the sequencing of the skill parts. Skill parts (and the relocation of a beanbag) that were executed in their proper order were summed to produce a score ranging from 0 to 8 for each performance and learning trial. Thus, an average score ranging from 0 to 8 was computed for every two performance trials and a score of 0 to 8 for learning trials. In sum, subjects' form and sequence scores were averaged across three blocks of performance and one block of learning trials, and these were used as dependent variables in subsequent analyses.

Experimental Protocol

Two adult females served as the researchers, one as the experimenter/demonstrator and the other as the videotape equipment operator. All testing took place in a university gymnasium, which contained only the equipment needed for the study. When children singularly entered the gymnasium testing area, they were first told that they were going to be asked to do some activities in a particular order. Children were then pretested on the six component subskills to be used in the study to ensure that they had the physical capabilities and knowledge for performing the skills. The experimenter demonstrated each skill in a predetermined order, then asked the children to repeat each skill. At this time, the experimenter also emphasized the form that was desirable for each of the skills, such as a backward crabwalk with eyes directed toward the ceiling and a hop on the left foot with arms extended horizontally. Only one child was eliminated from the study for being unable to successfully execute skipping.

After completing the pretest, chldren were then introduced to their assigned experimental protocol characterizing model type and verbal rehearsal manipulation. These included verbal model only, verbal model plus verbal rehearsal, and verbal rehearsal only conditions. Children in the verbal model only group were told, "Okay, now I'm going to show you the order of the skills and then have you do it. Remember that both the order and the way you do the skills are important to us." Children viewed two videotaped demonstrations of the skill sequence, from rear view and side view angles, while the experimenter verbalized the names of the skills being performed on the screen. After the second demonstration, the videotape player was shut off and the child was told, "Now it's your turn to do it. I want you to do the series of skills as best as you can remember. Both the order and the way you do them are important. We'll have you do the skills twice on your own."

Children in the verbal model plus verbal rehearsal group were given the same instructions until the videotape player was turned off. At this point, the experimenter said to the child, "Now tell me what you're going to do. Say the names of all the skills in the same order as you just saw them." The child then recited the skill sequence and was prompted when necessary. Children generally were able to repeat the order of skills by the second or third attempt. After the rehearsal period, the children were then provided with the same instructions as those in the verbal model only group.

Finally, children in the verbal rehearsal only group were not exposed to the videtaped model. Instead, they stood next to the motor skill course and were given two verbal explanations of the order of the skills to be executed. The experimenter recited the names of the skills in order as she pointed to the mats where the child was to complete the skills. After the two sets of verbal instructions, the child ws asked to tell me what you're going to do," after which the child completed two performance trials.

For each experimental group, children were again given the intervention protocol following the second and fourth trials, after which they performed two more trials of the skill sequence. After the sixth and final performance trials, each child was thanked and told that she would be coming back in two days for more activities. No information was given as to what these activities were, nor were the children told that they would be performing the same motor skill sequence. After a two-day retention period, the children returned to the gymnasium to perform three learning trials.

On arriving at the gym for the second time, the experimenter told the children that, "Today, we are interested in how many of the skills you remember that you did two days ago—both the order and the way to do them. This time, though, we are looking at how much you can remember without any instructions or demonstrations. We want you to do the motor skill course three times, trying to remember as many of the skills that you can. Just remember to do the best you can; that is the important thing." Children then performed three trials without any experimental intervention. At the completion of the learning trials, children were thanked for their efforts, were shown part of the videotape of their performance from the previous day, and asked some additional questions related to how they tried to remember the skills.

Procedure

Parents of the children in the appropriate age groups were sent a letter explaining the nature and purpose of the study. A follow-up phone call was used to secure approval and schedule appointment times for the performance and learning trials. On arrival at the gymnasium, parents signed research consent forms and were asked to wait outside the gymnasium. Children were tested individually in the presence of only two researchers. Both adults were familiar with the children through their association with the sports program in which these children were enrolled and easily developed a rapport with each child in the first minutes of the experiment. The reason for their involvement in the study was explained to the children, and then the children were pretested on the motor skills as described above. They were then introduced to the appropriate experimental protocol, executed six performance trials, returned two days later to perform three learning trials, and were thanked for their participation.

Results

The data were analyzed using a 2 x 3 x 4 (age group by model type by trial blocks) doubly multivariate repeated measures MANOVA (Schutz & Gessaroli, 1987). The dependent variables were the sequence and form scores that were averaged across performance and learning trial blocks. The correlation between these variables was $r = .65$, indicating that multicollinearity was not a concern and that a MANOVA was the appropriate statistical procedure to employ. Means and standard deviations for sequence and form scores by model type and trial block within each age group can be seen in Tables 1 and 2.

A significant age by model type by trial blocks interaction ws found, Wilks's $\lambda = .65$, $F(12,98) = 1.93$, $p < .04$, indicating that model type effectiveness on motor performance was dependent on age of the child as well as on phase of skill acquisition. Following this three-way interaction, a 3 x 4 (model type by trial block) repeated measures MANOVA was conducted for younger and older children separately. For older children, the interaction of model type and trial block was nonsignificant, Wilks's $\lambda = .69$, $F\ (12, 44) = p < .71$. These results indicated tht any of the model type conditions were equally effective for older children on both sequence and form scores during performance and learning phases. Figures 1 and 2 visually depict the trends in sequience and form scores, respectively, as a function of model type and trial block for older children.

For younger chldren, the model type by trial block interaction was significant, Wilks's $\lambda = .32$, $F(12,44) = 2.80$, $p < .01$. Student-Newman-Keuls post hoc tests ($p < .05$) were then conducted to determine model type differences for younger children at each trial block. These analyses indicated that differences between the model type conditions existed for both performance and hearing trials on sequence and form scores. Specifically, the model plus verbal rehearsal group achieved significantly higher sequence scores than both model only and rehearsal only groups for the first two performance trial blocks (see Figure 3). For the last performance trial block, however, model plus rehearsal was superior only to the rehearsal only group. Finally, analysis of the learning trial block indicated that model plus rehearsal and model only groups elicited higher sequence scores than subjects in the rehearsal only condition. Thus, the model plus rehearsal condition was most effective early in performance, but those who viewed only a model "caught up" with practice and recorded equivalent scores during later performance and learning trials. It should be noted that, for T2 through T4, the variability of sequence scores for the model plus rehearsal condition is at least one-half to one-third smaller than the variability for the other two groups. For form scores, post hc analyses indicated that both model plus rehearsal and model only groups performed better than the rehearsal only group at all performance and learning trial blocks (see Figure 4). Thus, viewing a skill being visually demonstrated or combining a visual demonstration with verbal rehearsal resulted in equally effective form performance for 5- and 6-year-old children.

To determine the magnitude of the differences in model type conditions among younger children, effect sizes (ES) were calculated according to recommendations by Thomas and French (1986). The comparison groups for computing the effect sizes for sequence and form scores were the model plus rehearsal and rehearsal only groups. Effect sizes were calculated by subtracting the means for these groups and dividing the value by their pooled standard deviation. For sequence scores,

Table 1. Means and standard deviations for sequence and form scores for older children ($n = 30$)

Model Type/ Trial Block	Rehearsal Only *M*	*SD*	Model Only *M*	*SD*	Model + Rehearsal *M*	*SD*
Sequence scores						
T1	6.25	1.6	5.40	2.0	6.20	2.0
T2	7.35	0.7	7.65	0.7	8.00	0.0
T3	7.60	1.3	7.80	0.4	7.95	0.2
T4	7.60	0.7	8.00	0.0	8.00	0.0
Form scores						
T1	22.33	3.0	24.78	4.6	23.45	3.8
T2	23.68	3.6	26.28	3.4	26.30	2.5
T3	23.73	2.8	26.20	3.2	25.88	2.8
T4	24.50	2.9	26.27	3.3	25.97	2.8

Table 2. Means and standard deviations for sequence and form scores for younger children ($n = 30$)

Model Type/ Trial Block	Rehearsal Only *M*	*SD*	Model Only *M*	*SD*	Model + Rehearsal *M*	*SD*
Sequence scores						
T1	3.10	2.2	3.10	2.3	6.00	2.0
T2	5.55	1.6	5.05	1.9	7.65	.7
T3	6.00	1.8	6.55	1.8	7.80	.6
T4	5.70	1.7	6.93	1.4	7.83	.4
Form scores						
T1	16.18	4.8	20.98	3.1	21.88	5.2
T2	18.93	4.7	22.83	1.3	23.33	3.4
T3	18.65	4.8	24.25	3.0	24.33	3.2
T4	17.87	5.6	22.73	2.6	24.47	3.4

Figure 1. Model type by trial blocks interaction for sequence scores on older children (*n* = 30).

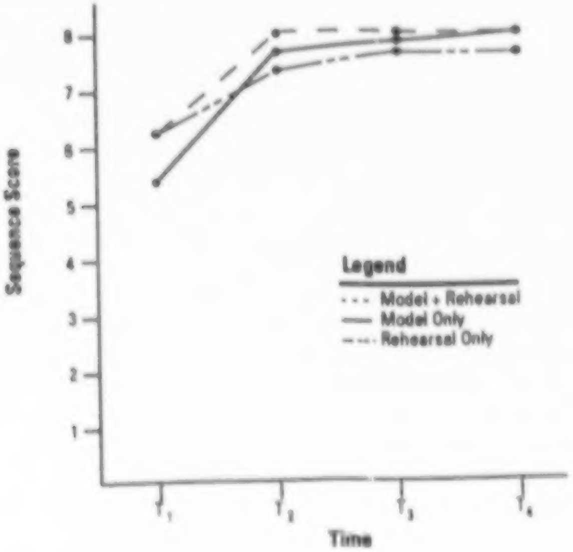


Figure 2. Model type by trial blocks interaction for form scores on older children (*n* = 30).

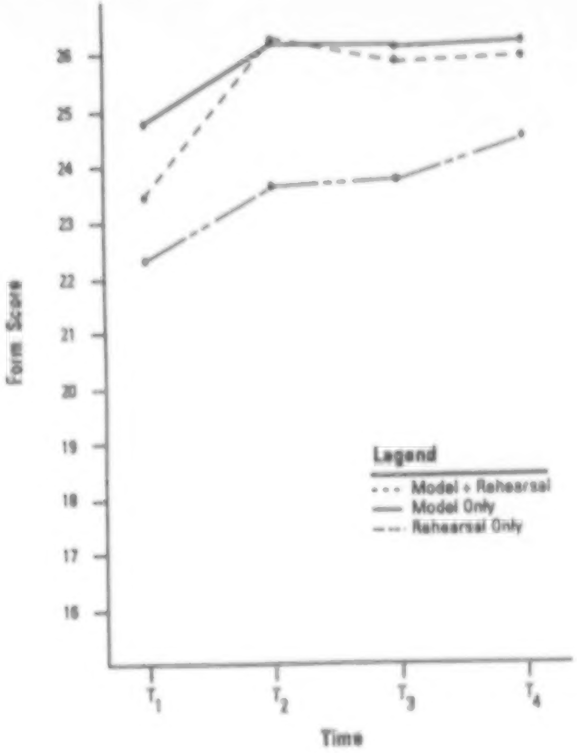


Figure 3. Model type by trial blocks interaction for sequence scores on younger children (*n* = 30).

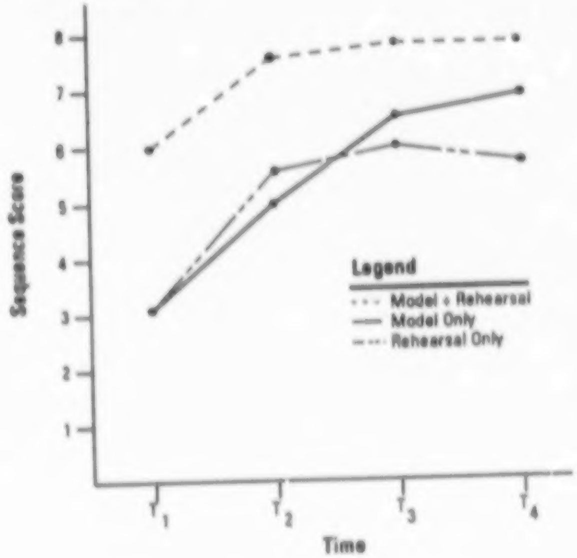
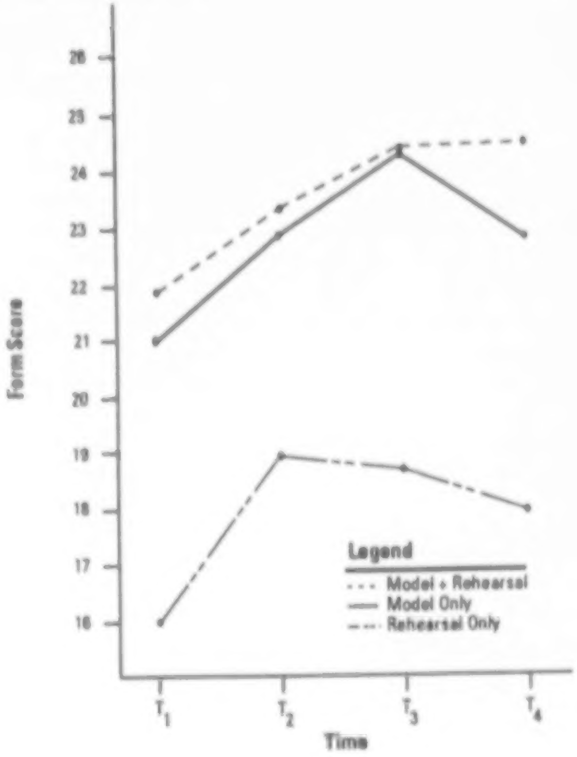


Figure 4. Model type by trial blocks interaction for form scores on younger children (*n* = 30).



the effect sizes ranged from .98 to 1.22, and for form scores the effect sizes ranged from .76 to 1.01. This means that a child in the model plus rehearsal condition scored about one to one and quarter standard deviation units higher on sequencing performance and about three-quarters to one standard deviation units higher on form performance than a child in the rehearsal only group. The magnitudes of these effect sizes are considered large (Thomas, Salazar, & Landers, 1991).

Discussion

The purpose of the present study was to extend previous developmental modeling research by examining in greater depth issues pertaining to learning versus performance and process versus outcome measures of motor performance. The results revealed that developmental differences vary according to model type and verbal rehearsal for both motor skill performance and learning. Further, these differences depended on whether sequencing (quantitative) or form (qualitative) performance assessments were considered. Specifically, the first hypothesis was partially supported. As predicted, older children performed equally well when either sequence or form was assessed under any of the model type conditions for both immediate performance and learning trials. However, contrary to predictions that younger children would perform best with a model plus rehearsal for learning trials only, it was found that a model plus rehearsal was superior to model only on the first two performance blocks for sequence and superior to rehearsal only subjects on sequencing scores for both performance and learning trials. Moreover, the model plus rehearsal and model only conditions both achieved higher form scores than the rehearsal only condition at both time periods.

These results are particularly strong in light of the effect sizes that were obtained. The magnitude of the group differences pointed to a minimum of three-quarters (form) and a maximum of one and a quarter (sequence) standard deviation units higher in the model plus rehearsal as compared to the rehearsal only condition. Thus, a show and tell model, one who visually and verbally conveys information about successful performance executive, is best for serial and matching performance in sport skills like these for learning and performance of younger children. A show and tell model combined with verbal rehearsal of skills was best for early performance trials, but viewing a modeled demonstration alone or one combined with rehearsal was equally effective in later performance and learning trials. Conversely, for children about 8 years and older, either using a show and tell model or prompting the use of verbal rehearsal only is sufficient for effective performance and learning of skills.

The second hypothesis was that younger and older children's form scores would be significantly better after exposure to a model plus rehearsal or model only than the rehearsal only condition. This hypothesis was also only partially supported. Although the model plus rehearsal and model only conditions did, indeed, result in superior skill form during the performance and learning phases for the younger age group, no differences in model type were found for older children on form scores. The model only and model plus rehearsal groups were consistently higher on form scores than rehearsal only at all four trial blocks, but these were not significant differences. These results indicate that a model alone or one combined with verbal rehearsal improves both quantitative and qualitative performance for younger children, whether it is performed immediately or during a retention period.

The findings from this study suggest that cognitive-developmental differences exist in the observational learning of motor skills under conditions varying in model type and verbal rehearsal. Moreoever, model type effectivness for younger children is dependent on performance and learning phases, as well as on whether sequential order or skill form are assessed. In sum, these results underscore that model effectiveness depends on the age of the observer, the performance measure employed, and whether immediate performance or long-term learning effects are of central interest.

These results did not replicate findings by Weiss and Klint (1987), who found only a rehearsal main effect for sequencing performance. That is, model plus rehearsal and rehearsal only groups performed significantly better than a model only group for both age groups. The Weiss and Klint study only employed quantitative measures at immediate performance trials. Looking at the parallel findings of the current study, younger children performed best under the model plus rehearsal condition only for early performance trials but did not differ from model only on later performance and learning. Perhaps the addition of task complexity by including unique aspects of form to each of the skills contributed to the disparate findings of Weiss and Klint and the current study. Conversely, the results of this study did replicate results found by Weiss (1983) in that model type effectiveness depended on the cognitive-developmental level of the observer, as well as supported findings from a recent study by Wiese-Bjornstal and Weiss (1992) in which the addition of verbal cues provided minimal improvement to throwing performance beyond that provided by the observation of a model correctly performing the skill.

The results of the current study were also different from those obtained in a study by McCullagh et al. (1990) in which modeling conditions were superior for form performance, but verbal rehearsal (no model) conditions were superior for sequence scores on a dance task. In the current study, we found support for the necessity of a visual model to elicit best form performance for younger children only, but verbal rehearsal was sufficient for sequencing performance for older children. Three protocol differences exist between the McCullagh et al. study and the present study that may contribute to the inconsistent findings. First, the verbal rehearsal protocol in McCullagh et al. only required one recitation on the part of the child. In the preseent study, children in the verbal rehearsal condition recited the sequence (usually two or three times) until accuracy was reached. Second, our study attempted to elaborate on the discrete scoring method for quantitative and qualitative scores in the McCullagh et al. study. In that study, subjects scored a 0, 1, or 2 for each trial, indicating omission, incorrect, or correct performance. In our study, quantitative performance ranged from 0 to 8 on each trial, and form performance ranged from 0 to 5 on each trial. Finally, McCullagh et al. employed five performance trials followed immediately (5 min) by five learning trials. In our study, learning was operationalized as a 2-day follow-up to the experimental protocol to ensure that modeling/rehearsal effects had waned and that we were maximizing the recall ability of the children in the absence of observational learning, verbal instructions, and verbal rehearsal. In sum, we believe our research design included a longer rehearsal period, a more detailed assessment of performance, and a longer retention period measuing effects on learning.

The results of this study support Yando et al.'s (1978) developmental and Bandura's (1986) social-cognitive theories of modeling. Bandura has recently couched the four constituent subprocesses of motivation, attention, retention, and motor production within a developmental analysis of observational learning. Bandura specifically outlines several attentional and retentional deficiencies evident in younger children with regard to observational learning and suggests that the development of selective attention, the ability to attend to multiple cues, memory strategies for facilitating storage and retrieval of visual information, and an enhanced knowledge base to help them comprehend new experiences are crucial to maximizing learning from the observation of models. Given these latest theoretical formulations concerning developmental modeling, it appears that the results of the present study support the notion that younger children in particular would benefit from a visual model with or without verbal rehearsal because these instructional conditions may serve to direct children's attention to the relevant task cues, provide deliberate strategies for facilitating memory via verbal labeling of visual stimuli, and prompt verbal rehearsal of task components.

Moreover, Bandura considers the sequencing of component skills such as the ones in this study to be characteristic of "learning" a new skill even though each of the skills already exist in the motor repertoire of the children. He believes that all skills or tasks have preexisting elements that are used to form unique integrations of behavior, and thus the unique patterning and coordination of skill form and sequencing in the present study qualify for investigating the observational learning capabilities in young children. This is an important issue because many of the complex sport skills that children learn are derivatives of already familiar skills (e.g., tennis serve derived from overhand throw). Thus, there may not be such a thing as a "novel" skill for which modeling effects may be determined devoid of experience.

Several lines of future research in developmental modeling can be outlined. First, more empirical study of the process of modeling and motor skill acquisition is needed—that is, what characteristics of the model carry salient information for observers to clearly differentiate, encode, and reproduce? To investigate this issue, more studies are needed to assess both process (i.e., form, technique, maturity) and outcome (i.e., error scores, distance, time) performance measures. When possible, it would appear that kinematic measures such as those employed by Wiese-Bjornstal and Weiss (1992) would provide information pertaining to *what* is being modeled by children. Also needed are more studies differentiating immediate performance from more enduring learning effects. The design of this study employed a 2-day retention period to allow experimental effects to dissolve and test for learning in the absence of modeling, instructions, or verbal rehearssal.

Finally, studies that distinguish between recognition and recall of correct performance are also important. Wiese-Bjornstal and Weiss (1992) demonstrated that, with repeated observations of a model and practice of a complex sport skill, young girls showed improvements in recognition of correct form, matching of correct form to the model (e.g., starting shoulder angle), but limited matching in outcome (e.g., absolute error). Similarly, French and Thomas (1987) found that boys' knowledge development related to basketball skills and strategies occurred prior to their ability to execute them. Thus, children may recognize their skill errors faster than they are able to motorically reproduce them with the use of modeling. Recently, Carroll and Bandura (1990) independently tested cognitive representation ability (recognition) and behavioral production (recall) of a complex action pattern. They found that a combination of multiple exposures to a model and concurrent verbal coding of the action pattern resulted in greatest accuracy of cognitive representation and behavioral reproduction. These results merit replication and extension to children and adolescents, as well as with a variety of motor skills.

In conclusion, this study extended previous developmental modeling research to examine the effects of observational learning on quantitative and qualitative aspects of performance under immediate and delayed motor recall conditions. The results clearly demonstrated that performance and learning are facilitated among younger children when a verbal model and verbal rehearsal are provided. Older children who possess a broader repertoire of memory strategies through their experience with motor skills benefitted equally from any combination of model types and verbal rehearsal. These results have several practical implications for teaching sports skills to children because acquisition is dependent on the quality of visual demonstrations, rehearsal strategies, and knowledge of results to correct motor performance.

References

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Carroll, W.R., & Bandura, A. (1990). Representational guidance of action production in observational learning: A causal analysis. *Journal of Motor Behavior*, 22, ;85-97.

Feltz, D.L. (1982). The effects of age and number of demonstrations on modeling of form and performance. *Research Quarterly for Exercise and Sport*, 53, 291-296.

French, K.E., & Thomas, J.R. (1987). The relation of knowledge development to chidren's basketball performance. *Journal of Sport and Exercise Psychology*, 9, 15-32.

Gallagher, J.D., & Hoffman, S. (1987). Memory development and children's sport acquisition. In D. Gould & M.R. Weiss (Eds.), *Advances in pediatric sport sciences: Vol. 2, Behavioral issues* (pp. 187-210). Champaign, IL: Human Kinetics.

Gould, D., & Roberts, G. (1981). Modeling and motor skill acquisition. *Quest*, 33, 214-230.

Gould, D., & Weiss, M. (1981). The effects of model similarity and model talk on self-efficacy and muscular endurance. *Journal of Sport Psychology*, 3, 17-29.

Little, W.S., & McCullagh, P. (1989). A comparison of motivational orientation and modeled instructional strategies: The effects of knowledge of performance and knowledge of results. *Journal of Sport and Exercise Psychology*, 11, 41-53.

McCullagh, P. (1986). Model status as a determinant of observational learning and performance. *Journal of Sport and Exercise Psychology*, 8, 319-331.

McCullagh, P., Stiehl, J., & Weiss, M.R. (1990). Developmental modeling effects on the quantitative and qualitataive aspects of motor performance. *Research Quarterly for Exercise and Sport*, 61, 344-350.

McCullagh, P., Weiss, M.R., & Ross, D. (1989). Modeling considerations in motor skill acquisition and performance: An integrated approach. In K.G.Pandolf (Ed.), *Exercise and Sport Sciences Reviews* (Vol. 17, pp. 475-513). Baltimore: Williams and Wilkins.

Schutz, R.W., & Gessaroli, M.E. (1987). The analysis of repeated measures designs involving multiple dependent variables. *Research Quarterly for Exercise and Sport*, 58, 132-149.

Thomas, J.R., & French, K.E. (1986). The use of meta-analysis in exercise and sport: A tutorial. *Research Quarterly for Exercise and Sport*, 57, 196-204.

Thomas, J.R., French, K.E., Thomas, K.T., & Gallagher, J.D. (1988). Children's knowledge development and sport performance. In F. Smoll, R. Magill, & M. Ash (Eds.), *Children in sport* (3rd ed.) (pp. 179-202). Champaign, IL: Human Kinetics.

Thomas, J.R., Pierce, C., & Ridsdale, S. (1977). Age differences in children's ability to model motor behavior. *Research Quarterly*, 48, 592-597.

Thomas, J.R., Salazar, W., & Landers, D.M. (1991). What is missing in p < .05? Effect size. *Research Quarterly for Exercise and Sport*, 62, 344-348.

Weiss, M.R. (1983). Modeling and motor performance: A developmental perspective. *Research Quarterly for Exercise and Sport*, 54, 190-197.

Weiss, M.R., & Klint, K.A. (1987). "Show and tell" in the gymnasium: An investigation of developmental differences in modeling and verbal rehearsal of motor skills. *Research Quarterly for Exercise and Sport*, 58, 234-241.

Wiese-Bjornstal, D.M., & Weiss, M.R. (1992). Modeling effects on children's form kinematics, performance outcome, and cognitive recognition of a sport skill: An integrated perspective. *Research Quarterly for Exercise and Sport*, 63, 67-75.

Yando, R., Seitz, U., & Zigler, E. (1978). *Imitation: A developmental perspective*. New York: Wiley and Sons.

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Curriculum Considerations

The majority of published work selected for inclusion in *Echoes II* fits into the next two categories—Curriculum Considerations and Pedagogical Considerations. (The separation of curriculum and pedagogy is acknowledged as an artificial one and was done here for organizational effectiveness.)

The complex concept of curriculum is represented by the variety of topics the section authors address: theoretical constructs of elementary school physical education; program goals; the content of children's physical education; and specific curricular concerns such as competition, gender role stereotyping, public relations, legal issues, and HIV/AIDS. The reader is stimulated to think about curricular choices and reasons one makes such choices.

Curricular Constructs and Parameters for Today's Elementary Physical Education

Marion Alice Sanborn and Cynthia L. Meyer

Elementary physical education curriculum today is in a state of flux. It has burst from the bounds of its historical orientation, frequently as a watered-down secondary program, and declared its independence. It has also begun to shed the patchwork quilt design described by Logsdon et al. as a dependence on the gimmickry and gadgetry of play.[1] Elementary physical education curriculum is beginning to emerge in the form of sound programs based upon logical theoretical constructs.

We have chosen to discuss briefly some of the forms (constructs) which are apparent in curricula today. In addition to the constructs, we have also identified some of the major parameters impinging on programs and affecting curricula. We feel that knowledge of these influences is essential to improvement of curricula.

If we believe curricula should be based on rational theoretical constructs and should have internal integrity as well as practical value, we need to examine any forces that inhibit sound curriculum construction so that we can begin to work toward lessening their deleterious influences.

Unfortunately, solid evidence regarding physical education curricula is not readily available today. Therefore, what follows is a result of our perceptions, which are in turn a reflection of our experiences. We recognize that other professionals with other experiences will have different perceptions. Perhaps ours will stimulate profitable dialogue.

CONSTRUCTS

1. **Structure of movement.** Probably the most influential and widespread recent construct has been the *structure of movement* as identified by Rudolf Laban.[2] Laban analyzed movement through the elements of space, time, effort, and flow. His work, first capitalized on by physical educators in England, has been firmly implanted as a structural framework for the movement education in this country. Content for structure of movement models generally includes concepts and terminology from Laban's analysis. Bain[3] notes that the basic concepts (body, shape, levels, effort, etc.) are the organizing centers for developing lessons for each unit, while the focus of the unit is on both conceptual understanding and skill. The structure of movement construct has not only provided direction for determining curricular content but has also facilitated communication about movement among curriculum makers.

2. **Traditional.** Despite the tremendous impact of the movement education approach on elementary physical education curriculum, pockets of *traditional* programs and practices can be found throughout the country. These curricula are mainly identified by their reliance on and use of physical activities as the organizing structure, though a few use physical fitness. Activity-based curricula encompass Bain's movement form construct but are not limited to activities of sport and dance.[4] According to Melograno, such traditional models could also include movement exploration, mimetics, low-organized games, and aquatics.[5] These activities

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not only provide the content but also define the structure of the models.

3. **Developmental.** Many current curricula derive their structure from a *developmental* construct. Content and process are selected with reference to developmental stages and accompanying growth pattern characteristics. The developmental construct is both widely accepted and utilized in almost every curriculum model. Yet, curricula that adhere exclusively to this construct are scarce.

4. **Cognitive.** The understanding and knowledge derived from the structure of the discipline provide a *cognitive* base for some elementary physical education curricula. Content is selected as a vehicle toward conceptual understanding. Some would describe such curricula as "Brunerian"[6] inasmuch as overriding concepts are "revisited" at different levels of complexity throughout the program. The Battle Creek Physical Education Curriculum Project[7] is an example of this construct.

5. **Student purposes.** The reasons why students engage in physical activities sometimes determine the curricular experiences. Values clarification and humanistic approaches frequently are utilized in this construct. In the Purpose-Process Curriculum Framework (PPCF) developed by Jewett and Mullan,[8] the reasons why humans move become the goals of the curriculum and the movement processes become a part of the teaching-learning situation. While the PPCF is one of the most sophisticated frameworks available in physical education, there are few actual curricula that utilize this or any other *purposes* construct exclusively.

6. **Integrative.** Although some current curricula can be neatly classified by model and/or theoretical construct, most curricula are *integrative* in nature. Their design reflects consideration for the developmental construct as well as other curricular constructs such as structure of movement, conceptual or cognitive, and student purposes. These constructs are drawn together by some overriding assumptions about children, learning, and movement. While such curricula might appear to be eclectic, they do derive their structure from sound theoretical reference.

A recent example of an integrative curriculum is the elementary guide published by the state of Ohio.[9] The model begins with explicit assumptions (beliefs) about children and movement and proceeds to goals, objectives, and finally learning activities, each component based on the preceding one. Developmental construct underpinnings are apparent in the "Moving About" ideas and process content ordering. Yet the structure of the model cuts across cognitive and structure of movement constructs as well. The model is truly integrative inasmuch as it draws on basic principles of two or more theoretical constructs.

> Although some curricula in elementary schools today can be classified by model or theoretical construct, most are a combination of the constructs described here.

7. **Acurricular.** Any discussion of where we are in curriculum must go beyond theory and models and look at practice. In so doing we detect a different sense of elementary physical education curriculum. Perhaps the term "acurricular" best describes programs that lack scope and sequence and seem to assimilate any attractive ideas and/or equipment that come along. An eclectic curriculum which had documents but did not fit into the integrative category would be acurricular as would any "curriculum" without documents.

We can better understand the predominance of such potpourri if we examine some of the forces from within and without that determine the form and sometimes the nature of curriculum practice.

PARAMETERS

1. **Sponsoring groups.** The type and makeup of the groups generating curriculum affect curriculum practice. Governmental agencies produce curricular guides that are either mandatory or suggestive. Counties and often school districts construct and revise guides for instructional planning for their educational bailiwick. University personnel frequently teach a particular curriculum to preservice and inservice teachers, and textbooks, written by professional educators, suggest and expound curriculum.

Melograno differentiates between teachers as curriculum consumers and teachers as curriculum designers.[10] Most of the documents generated from the above groups are "what to" and/or "how to" guides for the curriculum consumer. Melograno calls for a shift to curricula for the teacher as designer, which is certainly a worthy idea.

2. **Teacher diversity.** Another parameter is the extreme diversity among teachers of elementary school physical education. The range of background and expertise varies from the unwilling and uninformed classroom teacher assigned to teach physical education to the highly motivated elementary physical education specialist. Those who lack knowledge, time, and sometimes interest can hardly be motivated to design theoretically sound curricular offerings. Consequently, teachers are often forced to draw on available curricular materials and that option is often restricted by knowledge, policy, and time.

3. **Professional isolation.** Professional isolation of specialist teachers in elementary schools compounds the forces of diversity. It also makes it easy, even inviting, for teachers to ignore existing curricular documents and plan on a day-to-day basis, thus increasing the number of acurricular programs. It is possible for physical education specialists to go for weeks at a time without the professional give and take that is a part of life for the classroom teacher. Even supervisory input from the principal or director of elementary education tends to dissociate itself from physical education curricular concerns. A physical educator is isolated from other physical education specialists during work hours, and if he/she does not attend professional meetings, it is possible to be without professional stimulation, specific to the field, for long periods of time.

4. **Curriculum specialists.** Even the highly motivated elementary specialist cannot be expected to function without some guidance from an interested curriculum specialist. Most often the task of physical education curriculum in the schools has been left to the teachers and frequently is the result of pooled naiveté. Where school systems do have a curriculum specialist, they frequently are either afraid to show their ignorance in specialized areas or lack the facilitating skills essential to assisting others with curriculum. Thus physical educators are often on their own to do what they will (or won't) with curriculum.

5. **Curriculum naiveté.** Most teachers in the field have not had curriculum courses from curriculum specialists. Their teachers have been physical educators, many of whom have not had the opportunity themselves to learn curriculum from curriculum specialists. Further, physical education curriculum teachers frequently have their biases and rather than teaching *curriculum*, they concentrate on teaching a specific curriculum with variations. This results in prospective teachers having a limited view of curriculum, one which does not understand structure, model uses, and basic curriculum construction principles.

6. **Equipment, not texts.** We might still salvage curriculum direction, if textbooks were available and in students' hands. The lack of published student texts increases the importance of curriculum documents. In place of texts, physical educators frequently plan around equipment and facilities and make curriculum decisions on the basis of what is available, instead of seeking what is needed on the basis of curricular decisions. The reality is that lack of texts frees teachers to determine or change curriculum while equipment and facilities frequently limit the extent and direction of that change.

7. **Outside forces.** No discussion of parameters would be complete without mentioning some of the outside forces influencing or dictating curriculum. Legislation has been influential, for example, Title IX, P.L. 94-142, and various state requirements set by law. Societal forces have brought a shift from team sports to lifetime sports, particularly in the upper elementary grades. Programs such as New Games and Outward Bound have been influential in curriculum decisions. The youth sports movement has forced a greater emphasis on competition in elementary grades in a number of school districts. All of these outside forces and others have affected and will continue to affect curricula for better or for worse.

Endnotes

1. Logsdon, Bette J., et al. *Physical education for children: A focus on the teaching process*. Philadelphia: Lea & Febiger, 1977.
2. Laban, Rudolf. *Modern educational dance* (2nd ed. revised by Lisa Ullman). New York: Frederick A. Praeger, 1963.
3. Bain, Linda. Status of curriculum theory in physical education. *JOPER*, 49: 25-26, March 1978.
4. Ibid.
5. Melograno, Vincent. *Designing curriculum and learning: A physical coeducation approach*. Dubuque, IA: Kendall/Hunt Publishing Company, 1979.
6. Bruner, S.J. *The process of education*. Cambridge: Harvard University Press, 1966.
7. Vogel, Paul, et al. Battle Creek Physical Education Curriculum, *JOPER*, 40: 25-29, September 1969.
8. Jewett, Ann E., and Mullan, Marie R. *Curriculum design: Purposes and processes in physical education teaching and learning*. Washington, D.C.: AAHPER Publications, 1977.
9. Sanborn, Marion Alice, et al. *Elementary school physical education: Beliefs, goals, objectives, activities*. Columbus: Ohio Department of Education, 1978.
10. Melograno, Vincent. Status of curriculum practice: Are you a consumer or designer? *JOPER*, 49: 27-28, March 1978.

Motor Skill Acquisition — An Essential Goal of Physical Education Programs

The false assumption is that students learn motor skills by playing games. This may be true when students play hours and hours at one game, e.g., basketball or baseball. But there aren't hours and hours in physical education programs that can be devoted to playing games.

George Graham

When videotape recorders first became available I taped many of my classes. Because videotape technology was new the students enjoyed seeing themselves on television and I learned a great deal from watching my classes.

One of my favorite videotapes was of a third grade class who had designed their own throwing and catching games. I delighted in showing others the games the students had invented. One day as I was showing it to a class of university students, instead of focusing on the games, I began to carefully observe the ability of my students to throw and catch. I was shocked! I was so pleased with the games they had designed that I failed to realize many of them had not learned the basics of throwing and catching. Even though I had taught opposition, many of them were still stepping with the same foot as the throwing hand. A number of them were holding their hands incorrectly when they were trying to catch. I had "taught" throwing and catching but obviously the children hadn't "learned" to throw and catch using the correct form.

Do you have a videotape of one of your classes? Before you read further you may want to look at it to see how well your students have learned the motor skill(s) that are the focus of the lesson on the videotape. Be sure to look at all the students—not only those who are highly skilled.

If you were asked to make a list of the top five goals or objectives for your physical education program, a statement relating to motor skill acquisition (or improvement) would no doubt be included. Motor skill acquisition is a priority for physical educators. As a profession, however, we don't appear to be succeeding in this goal.

The purpose of this article is to:

- present evidence, albeit limited, that we aren't successfully helping students acquire motor skills, and
- suggest ways by which we can be more effective in our teaching of motor skills.

The term "motor skill" is used to refer to both fundamental movements skills such as running, twisting, throwing and striking an object and also basic sport skills which are combinations of fundamental movement skills: for example, throwing a ball in a game or a

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combination of running and jumping in dance or gymnastics. Typically, fundamental movement skills are emphasized in elementary schools and basic sport skills are taught at the secondary level. In either case, there is evidence that many of our students are not learning motor skills.

The evidence

The best source of evidence we have is the National Children and Youth Fitness Study (Ross & Gilbert, 1985). This study surveyed 8,800 5th-12th grade students nationwide from 140 schools in 19 states. The study noted:

> Among younger students, the short weekly activity time, lack of time and facilities to change clothes and shower, and heavy reliance on relays and informal games restrict the opportunities for learning. For older students, physical educators continue to rely heavily on competitive sports and other activities that students cannot readily continue throughout adulthood. Inadequate investment is being made in conveying the physical skills needed for active lifestyles (p. 48).

Unfortunately, the National Children and Youth Fitness Study (NCYFS) chose to test children only on health related physical fitness items. The authors inferred that children were not acquiring the motor skills needed for physically active lifestyles, but then did not actually assess motor skills. Two other studies, conducted in Michigan and the province of British Columbia, Canada, did test students on motor skill acquisition. Both studies corroborated the NCYFS inference that many students are not learning motor skills.

Michigan Educational Assessment Project (MEAP). The Michigan study (Reuschlein & Vogel, 1985) drew a stratified random sample of more than 1,500 students from 117 schools representing 61 different school districts. Both qualitative and quantitative measures were used to assess the motor skill acquisition of 4th and 7th grade students (see Table 1). "Qualitative measures refer to those elements of performance advocated by motor development specialists that are associated with good form or biomechanically correct technique. Quantitative measures refer to performance outcomes such as distance, time, frequency or accuracy" (Reuschlein & Vogel, 1985). Tenth grade students were included in the study but not tested on motor skills. The overall performances (qualitative and quantitative combined and separately) were lower than anticipated by the investigators, causing them to recommend changes in either the performance expectations for the state (the expectations for motor skill acquisition may have been too high) and/or the delivery system for physical education in Michigan schools, i.e., the amount of time and the way physical education was being taught.

British Columbia Assessment of Physical Education (BCAPE). The British Columbia, Canada study (Carre et al., 1979) assessed a provincially representative sample of 3,000 public school children in grades three, seven, and eleven. One of the areas assessed was motor

Table 1. Percentage of Students Achieving Combined Qualitative and Quantitative Motor Performance Standards—Michigan Educational Assessment Project

Fundamental Motor Skill	4th Grade*	7th Grade*
Locomotion		
Hop	60.1	42.4
Skip	90.7	80.5
Body Projection		
Horizontal Jump	43.0	51.1
Vertical Jump	42.7	18.3
Object Projection		
Overhead Throw	47.4	49.1
Forehand Stike	57.7	31.9
Object Reception		
Catch	51.1	69.3
Bounce	63.4	63.5

*The results cannot be compared directly across grades because the test battery differed by grade level, i.e., the 7th grade battery was more difficult. From "Motor Performance and Physical Fitness Status of Regular and Specal Education Students" (p. 154), by P.L. Reuschlein & P.G. Vogel in J.E. Clark & J.H. Humphrey (Eds.), *Motor Development (1985)*, Princeton, NJ: Princeton Book Co.

Table 2. Percentage of Students Who Scored Above the Mid-Point of the Acceptable Range in Motor Ability—British Columbia Assessment of Pysical Education

Motor Ability	3rd Grade*		7th Grade*	
	Girls	Boys	Girls	Boys
Agility	43	47	40	53
Hand-Eye Coordination	37	60	23	56
Locomotor Skills	54	54	60	76
Overhead Throw for Form				
Feet	27	84	19	65
Body Rotation	42	88	46	80
Arm Action	14	67	2	19

*The results cannot be compared directly across grades because the standards for acceptable performance varied for each grade level.

Note: From *British Columbia Physical Education Assessment: Summary Report* (p. 26) by F.A. Carre, R. Carre, R.E. Mosher, R.W. Schutz, P. Thomson, E. Farnholtz and C.L. Bullis, British Columbia Ministry of Education, 1979.

ability. The experts who interpreted the results (see Table 2) rated the students as "weak" or "marginally satisfactory" in most of the motor skills studied. Both of the studies found that the girls in their samples were consistently less skilled than the boys.

Why are the results of the motor skill assessments in these studies lower than expected or hoped for? There are at least five reasons which collectively help to explain why many students are not acquiring motor skills through physical education programs.

Five reasons for low motor skill acquisition

Time spent in physical activity. The first reason is obvious. A series of studies assessing how physical education teachers use their time (Siedentop, 1983) show that students spend a substantial amount of time listening to the teacher talk, engaged in management (getting out equipment, picking teams, changing from one activity to another), and waiting (see Table 3). Although the studies were conducted in three different countries the analyses are remarkably similar. The students averaged less than one-third of their time in physical activity. Students simply didn't have many opportunities to practice (or move or play). It's blatantly clear that if students are going to learn a motor skill they need plenty of opportunities to practice.

Refining the motor skill. The data in the Michigan and British Columbia studies suggest that many of the students were not performing the skills correctly, i.e., one or more of the qualitative criteria was not present. This may be because teachers don't emphasize (and continually practice and reinforce) the qualitative aspects of motor skills. Rink (1985) used the term "refinement" to describe the process of emphasizing the way a skill is performed, i.e., the quality of the movement. Her research suggested that teachers spent substantially more time providing students with a variety of drills or tasks when they were teaching a motor skill than focusing on actually learning the qualitative aspects of a motor skill.

Watch a class of high school students playing softball. Notice how many of them throw overhand improperly. Note the number who fail to use opposition when they throw and those who don't extend their arm

Table 3: Student Time Data from Four Major Research Programs

	Western Canada (McLeish)	Belgium (Pieron)	Teachers College (Anderson)	Ohio State (Siedentop)
Management	20%	6%	13%	22%
Waiting	22%	32%	25%	24%
Receiving Information	22%	23%	25%	15%
Engaged Motor Time	26%	30%	27%	21%

Note: From *Developing Teaching Skills in Physical Education* (2nd ed.) (p. 61) by D. Siedentop, 1983, Palo Alto, CA: Mayfield.

during the windup phase. Unfortunately, even today, you will see that many of those who throw incorrectly are girls. There's no anatomical or biomechanical reason why girls can't throw correctly. They just haven't learned, even though they may have attended physical education classes for six or even eight years! Apparently their teachers haven't emphasized and insisted that the students learn the qualitative aspects of the overhand throw. Students have been "exposed" to the correct way of throwing, but they haven't learned to throw correctly.

Specific feedback. Part of the reason that students haven't learned to throw correctly may be because their teachers didn't provide them with adequate amounts of feedback to let them know that they weren't throwing correctly (and that it was important to learn to practice throwing properly). Several studies (Graham, Soares, & Harrington, 1983; Pieron, 1981; Yerg, 1978) have suggested that teachers don't provide much feedback and that the feedback they do provide is general ("Good") rather than specific ("Yes, that time you stepped with the opposite foot"). When teachers provide individuals with specific feedback about their performance, students learn:

- whether they are performing the skill appropriately. This is especially important for beginners who often have a difficult time analyzing their performance and knowing which cues should receive their selective attention (Thomas & Gallagher, 1986).
- that the teacher places a great deal of importance on the movement process (the quality of the movement) because it is crucial for long-term success.

Games. A fourth reason that students may not be learning motor skills to the extent desired is that they are spending more time playing games than actually practicing motor skills (Ross & Gilbert, 1985). The false assumption is that students learn motor skills by playing games. This may be true when students play hours and hours at one game, e.g., basketball or baseball. But there aren't hours and hours in physical education programs that can be devoted to playing games.

The sad fact is that in many games a few students receive the majority of opportunities. Kickball, for example, was reported by the students in the NCYFS study as a game that was played regularly, along with dodgeball and bombardment. Wilson (1976) studied the game of kickball and found that students averaged slightly over two opportunities to catch in a typical kickball game and less than two opportunities to kick (1.87 per child) or throw (1.22 per child). Unfortunately, a number of the students never had an opportunity to throw or catch, especially girls (see Table 4). Parker (1984) also found that students had relatively few opportunities to practice motor skills in volleyball and softball, even when the adult versions of the games were modified according to popular recommendations.

Physical education, as taught in the schools, appears to be undergoing a change. One change that needs to be carefully considered is the value of games in physical education programs. What have we accomplished when students know the rules of a game, but don't possess the prerequisite skills to play the game with any degree of success? Can we really justify three or four week tournaments when the lesser skilled students in the class will have so few opportunities to improve the motor skills that are used in the game?

Transition. The final reason that students are not learning manipulative motor skills relates partially to successful games playing. All too often we teach a motor skill that is to be used in games as if it were a closed skill (a skill used in a relatively predictable, static environment) when, in fact, the skill will be used in

Table 4. Attempts to Throw, Catch and Kick in the Game of Kickball

	Boys (n = 74)	Girls (n = 79)	Total (n = 153)	Overall Percent
Attempted to kick	71	75	146	95.42
No attempt to kick	3	4	7	4.58
Attempted to catch	65	35	100	65.36
No attempt to catch	9	44	53	34.64
Attempted to throw	48	26	74	48.37
No attempt to throw	26	53	79	51.63

Note: From "The Frequency and Patterns of Utilization of Selected Motor Skills by Third and Fourth Grade Girls and Boys in the Game of Kickball" (p. 81) by N. Wislon, 1976, Unpublished Master's Project, University of Georgia.

dynamic, constantly changing environments (an open skill). Perhaps the best illustration is the way we formerly taught the basketball dribble. Historically, we organized students into four lines. One at a time the first student in the line dribbled to the end of the court with the right hand and back with the left hand. After several variations on this idea in which students typically received four or five chances to dribble, a relay was organized and a winning team determined. Then students were organized into teams for a game.

The problem, of course, is that in these drills students never received the opportunity to practice against an opponent. So once they started the game, and someone tried to steal the ball, the dribbler often lost control. Quickly the students in the game learned who could dribble and who couldn't and only those who were adept at dribbling were permitted to do so. So what happened to those who weren't very good at dribbling? They rarely got a chance to practice dribbling. What they did learn was how to stay out of the way.

Some questions to consider

If someone asked to test your students on a variety of skills, how would they do? If you are able to answer that virtually all of the students would do well then you are to be congratulated. The third grade class that I referred to in the beginning of the article wouldn't have done very well even though I thought I was effectively teaching those skills. If you are concerned that perhaps your students wouldn't do well you may want to consider your answers to the following questions:

1. How much time are the students spending in productive practice? Am I providing ample time for my students to practice the motor skills or is there a lot of waiting and time spent in management?
2. Am I refining the qualitative aspects of the motor skills—focusing attention on the correct way to perform a skill within the lesson, from lesson to lesson, and from year to year?
3. Am I providing appropriate amounts of specific feedback? One easy way to answer this question is to make an audiotape of a lesson and then analyze the feedback. To whom am I providing feedback? Is the feedback general or specific?
4. How much time do the students in my classes spend playing games? If you have a student who is not participating, ask the student to tally the number of practice opportunities a low-skilled and a high-skilled player have in a game. Is the low-skilled student getting as much practice as the high-skilled player?
5. Am I providing the appropriate transitions so students can actually practice open skills in dynamic environments that aren't "official" games so students can try again and again without fear of penalty or harassment?

Physical education is obviously more than motor skill acquisition. For many of us, however, learning to move efficiently and effectively is a major trust of our programs. While some might argue that children today are learning motor skills in after school and youth sport programs, the limited evidence we have suggests otherwise. When students spend six or eight or ten years in organized physical education classes and still haven't learned the basic motor skills, haven't we failed in one of our major responsibilities as physical education teachers?

References

Carre, F.A., Mosher, R.E., Schutz, R.W., Thomson, P., Farenholtz, E., & Bullis, C.L. (1979). *British Columbia physical education assessment: Summary report*. British Columbia Ministry of Education.

Graham, G., Soares, P., & Harrington, W. (1983). Experienced teachers' effectiveness with intact classes: An ETU study. *Journal of Teaching in Physical Education*, 2(2), 3-14.

Parker, M. (1984). The effects of game modifications on the nature and extent of the skill involvement of students in volleyball and softball. Unpublished doctoral dissertation, Ohio State University.

Pieron, M. (1981, April). Research on teacher change: Effectiveness of teaching a psychomotor task in a micro-teaching setting. Paper presented at the American Alliance for Health, Physical Education, Recreation and Dance Convention, Boston, MA.

Reuschlein, P.L., & Vogel, P.G. (1985). Motor performance and physical fitness status of regular and special education students. In J.E. Clark & J.H. Humphrey (Eds.), *Motor development* (pp. 147-164). Princeton: Princeton Book Co.

Rink, J. (1985). *Teaching physical education for learning*. St. Louis: Mosby.

Ross, J.G., & Gilbert, G.G. (1985). The National Children and Youth Fitness Study: A summary of findings. *Journal of Physical Education, Recreation and Dance*, 56(1), 45-50.

Siedentop, D. (1983). *Developing teaching skills in physical education* (2nd ed.). Palo Alto, CA: Mayfield.

Thomas, J.R., & Gallagher, J.D. (1986). Memory development and motor skill acquisition. In V. Seefeldt (Ed.), *Physical activity & well-being*. Reston, VA: AAHPERD.

Wilson, N. (1976). The frequency and patterns of utilization of selected motor skills by third and fourth grade girls and boys in the game of kickball. Unpublished master's project, University of Georgia.

Yerg, B. (1978). Identifying teacher behavior correlates of pupil achievement. In *Research Consortium Symposium Papers: Teaching Behaviors and Sport History* (Vol. 1, Book 1). Washington, DC: AAHPERD.

Can We Help Children Move and Think Critically?

Craig A. Buschner

Finding ways to help children learn to grow is the task of early childhood educators. Teachers of movement and play have the opportunity to actively involve children in many types of learning. One type of learning receiving increased attention is the development of critical thinking skills. Most of this influence has resulted from national studies that find children and young adults deficient in this area. Some feel that teachers are not helping children to "think" regardless of subject matter. Lipman (1988) defines critical thinking as "skillful, responsible thinking that facilitates good judgment because it (1) relies upon criteria, (2) is self-correcting, and (3) is sensitive to context." Maxwell and Paulu (1987) suggest that teachers give students a "manageable way to evaluate information."

Traditionally, play and movement programs for children have emphasized acquisition of motor skills so that children can become both competent and confident movers. However, many feel that developing intellectual skills is also a goal of quality movement programs for children. Despite the lack of documentation that critical thinking takes place in early childhood movement programs, movement experiences can be a vehicle for the development of analytical skills.

Moving and Thinking Critically

As a physical educator I have always believed that I was teaching children to think as well as move. A few weeks back I was teaching a kindergarten class about personal and general space. I defined the two terms, gave examples, and proceeded to have the children solve a number of movement tasks. In personal space we worked on body part identification, made body shapes, and discovered the limits of personal space by stretching in all directions and levels. In general space we used the locomotor patterns to find different ways the body could move, varying the time, force, and flow of movement. We culminated the lesson by playing "Don't Bump" or what the movement educators call "safety training." A majority of the 28 children stayed on task for the 30 minute class and appeared to understand the lesson focus. Proudly, I felt they *learned* to differentiate between personal and general space as I closed the lesson with a question and answer period. My intuition told me that the children were *thinking* and *moving* based upon my observations and their responses to the problems I posed.

After surveying the literature in the areas of early childhood education, motor development, elementary physical education, research on training, and critical thinking, I am left with a personal question: Did I in fact teach the children to think? As I began to mull over the concept of thinking skills, numerous questions came to mind. What are thinking skills? What is the difference between thinking and thinking critically? Are young children capable of critical thinking in physical education? Can critical thinking skills in young children be identified and measured? Finally, a pessimistic question: Should physical educators even bother with thinking skills in that most would agree that our unique contribution to children resides in the areas of motor skill and physical fitness?

This paper provides a means for educators, particularly physical educators, to understand the concept of thinking skills and more specifically critical thinking skills. Following my assumptions, four areas will be addressed: (1) the nature of critical thinking; (2) a brief literature review on thinking skills in children; (3) practical suggestions on how to integrate thinking skills in early childhood physical education programs; and (4)

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the educator's role in promoting thoughtful movement. During this venture into critical thinking I hope to provide an answer to the question posed in the title of this article.

My own personal beliefs about young children should be stated before I proceed with each section of this paper. These assumptions provide me with a starting point from which to base my comments and reflect on my own work with preschool children over the past 15 years.

1. Early childhood educators must be concerned with the "whole child." That is, we teach children and not subject matter. Children develop intellectually, physically, socially, and emotionally, and each area is important to the child's growth and development. Furthermore, effective teaching and learning must activate all three domains of learning (cognitive, affective, psychomotor). Finding ways to help children learn and grow is the task of early childhood educators. In short, movement is learning for young children.

2. Through movement young children begin to make sense of themselves, their bodies, their surroundings, and their world. Boucher (1988) said that "early movement experiences are the basis of all learning and constitute the child's first language" (p. 452). Movement based curriculum is the "alphabet" for learning about movement and is most logical for young children (Gabbard, 1988; Schurr, 1975; Siedentop, Herkowitz, & Rink, 1984; Stanley, 1977).

3. How we teach young children is as important as what we teach them.

4. Skillful movement is the primary goal of preschool physical education programs. However, planning cognitive and affective learnings are also worthy program goals.

5. Young children have a right to "structured" as well as "unstructured" time in physical education and motor play, although my ideas will focus primarily on structured experiences for children.

6. Children in today's society are being "hurried" to grow up and this presents problems for all educators of young children (Elkind, 1972, 1988; Katz, 1988; Postman, 1985; Seefeldt, 1985).

Cognitive Development in Children

Before we take an excursion into the nature of critical thinking I feel it's important to discuss cognitive development in children. Cognitive development includes thinking, discovering, acquiring knowledge, making decisions, and solving problems. Jean Piaget's stages of cognitive development are often used when attempting to understand how children think (Wadsworth, 1971). Piaget's four stages of intellectual development include the *sensory-motor stage, preoperational stage, concrete operations stage,* and the *formal operations stage*. It is the second stage, preoperational, where most preschool children function. After passing through the sensory-motor stage during the first two years of life children begin prelogical thought and attempt to find rudimentary solutions to everyday problems. Young children from ages two through seven demonstrate an ability to perceive, conceptualize, imagine, and use language.

Young children learn through *accommodation* and *assimilation*. We know that children learn from work and from play. Both are essential. Moreover, both manipulative and verbal experiences, often accomplished through motoric play, help to stimulate thinking and learning. This explains why Piaget advocated both active and interactive environmental learning. Piaget determined that "knowledge is not transmitted verbally" but absorbed through a variety of experiential learnings (Penrose, 1979).

Cognitive development occurs in physical education and can be classified into perceptual abilities (visual and kinesthetic), movement awareness, inquiry, creativity, relationships, and academic reinforcement (Curtis, 1987; Gabbard, LeBlanc, & Lowry, 1987; Gallahue, 1982). Cognitive development closely relates to how children process information in the movement environment. Keogh and Sugden (1985) see children trying a three step thought process when attempting movement tasks: (1) movement preparation that uses the body, environment, space, and time; (2) generation or selection of a movement plan; and (3) movement plan execution. All three steps require thinking, that is, reflection and thought, before and during movement.

Critical Thinking

Critics of education have been complaining for years that schools and colleges are not helping students to learn how to think. Most of the recent criticism has resulted from national studies that find students deficient in thinking skills.

Fortunately or unfortunately, depending upon your view, we are experiencing not only increased attention but a downward movement, from college to preschool, of the thinking skills curriculum. Thinking skills books, articles, and programs have become one of the "in vogue" topics in education today (Brown, 1983; Chance, 1986; de Bono, 1983; Johnson, 1984; Joyce, 1985; Nickerson, 1984).

However, this overnight surge of interest has confused many educators and has raised numerous questions concerning the validity of this educational thrust (Bereiter, 1984; Beyer, 1984a, 1984b; de Bono, 1984; Paul, 1984, 1985; Rose, 1986; Sternberg, 1985a, 1985b, 1987; Wassermann, 1987).

Now we need to take a moment to differentiate between the terms "thinking skills" and "critical thinking skills." Both terms have many definitions depending upon whom you read. Thinking, quite simply, is to use the mind rationally, to conceive or form in the mind, particularly an opinion or belief.

Many consider Benjamin Bloom's (1974) taxonomy of the cognitive domain to be the essential thinking skills to be learned by pupils. This hierarchy includes knowledge, comprehension, application, analysis, synthesis, and evaluation. These six levels of cognition constitute the diet of preservice teacher education, inservice workshops, textbooks, curricula, and statewide teacher evaluation systems. However, a number of educators, philosophers, and cognitive psychologists feel Bloom's work only scratches the surface of potential thinking skills that need to be taught (Ennis, 1985; Paul, 1985). Beyer (1988) has expanded Bloom's levels to include translation, interpretation, extrapolation, and reasoning (inductive and deductive).

Although there are many different theories of thinking, Raths, Wassermann, Jones, and Rothstein (1986) suggest 14 thinking tools that include: comparing, interpreting, observing, summarizing, classifying, making decisions, suggesting hypotheses, imagining and creating, criticizing and evaluating, designing projects and investigations, identifying assumptions, applying principles in new situations, coding for certain patterns of thinking, and gathering and organizing data. Beyer (1984a) defines thinking as mental processes that help people to formulate thoughts, to reason about, or to judge. Beyer (1988) goes beyond this definition to propose Level I Thinking Strategies that include problem-solving, decision-making, and conceptualizing. Each of these thinking strategies includes complex subordinate operations.

On the other hand, critical thinking includes the basic thinking skills but goes beyond these concepts to include even high order, and more complex, thought processes. I sense a need to share a variety of definitions and views of critical thinking so that we have a complex picture. Heiman and Slomianko (1985) carefully defined critical thinking as: raising questions, analysis, relying on prior knowledge, and translating ideas into examples. Put another way, critical thinking gives pupils a "manageable way to evaluate information" (Maxwell & Paulu, 1987). Ennis (1985) views critical thinking skills as "reasonable reflective thinking that is focused on deciding what to believe or do" (p. 45).

The most elaborate notion of critical thinking suggests that critical thinkers are skillful and exercise good judgment (Lipman, 1988). Lipman offers his definition by stating that critical thinking is "skillful, responsible thinking that facilitates good judgment because it (1) relies upon context, (2) is self-correcting, and (3) is sensitive to context" (p. 39). Lipman further explains his definition adding that "when we think critically, we are required to orchestrate a wide variety of cognitive skills, grouped in families such as reasoning skills, concept-formation skills, inquiry skills, and translation skills" (p. 43).

Again, I will rely on Beyer's (1988) Level II Critical Thinking Skills list to clarify what processes critical thinkers use:

1. Distinguish between verifiable facts and value claims.
2. Distinguish relevant from irrelevant information.
3. Determine factual accuracy of a statement.
4. Determine the credibility of a source.
5. Identify ambiguous claims or arguments.
6. Identify unstated assumptions.
7. Detect bias.
8. Identify logical fallacies.
9. Recognize logical inconsistencies in a line of reasoning.
10. Determine the strength of an argument or a claim.

Interestingly enough, some of the theorists are concerned about "thinking dispositions," working concurrently with the critical thinking operations (Ennis, 1985; Paul, 1985). For example, dispositions of critical thinkers would embrace sensitivity to others, being open-minded, focusing on the big picture in any situation, and taking a position on certain matters.

For those of you still with me, some interesting questions should surface: Are critical thinking skills content or process? Is critical thinking a separate subject or should it be embedded in other subjects? Are critical thinking skills, as defined above, appropriate for young children? So you won't think I am off base with this paper or leading you down the path of professorial snobbery, I would like to note that I am well aware that these mental operations do not coincide with typical stages of intellectual growth in young children. Nor do these critical thinking skills correspond with Piaget's preoperational stage. However, let us continue our inquiry.

Review of Literature

This review of literature will briefly describe some programs that emphasize thinking skills for children and report on a handful of empirical studies.

Let me preface this review by saying that early childhood educators often side philosophically with one of two curricular approaches. One is child centered, using a "developmental" view that often follows Piaget's or Erik Erickson's stages of child growth and development. This view emphasizes child growth across a broad range of developmental areas to include all three domains of learning (ASCD Early Childhood Education Policy Panel, 1988). The other curriculum model uses an "academic approach" that is usually content centered, and follows the traditional educational paradigm. This approach systematically sequences planned learning experiences, often through direct instruction, and children are expected to become competent in reading, language concepts, and basic arithmetic by the time they leave preschool. More often than not the thinking skills curriculum models for young children follow the academic approach.

Chance (1986) described six programs for the teaching of thinking at both the elementary and secondary levels. These include: (1) CORT Cognitive Research Trust Thinking Lessons developed by Edward de Bono; (2) Productive Thinking Program; (3) Philosophy for Children developed by Matthew Lipman; (4) Odyssey developed by the Venezuelan Ministry; (5) Instrumental Enrichment developed by Reuven Feuerstein; and (6) Thoughtful Teaching. Each of these programs is finding success in teaching thinking skills and Lipman's program claims to engage elementary aged children in critical thinking skills. However, none of these programs have been used with young children.

Examples of academic curricular models that often include systematic teaching of thinking skills would be the Montessori Method schools and the Perry Preschool Project that operated out of Ypsilanti, Michigan from 1961-1967 (Cryan & Surbeck, 1979), Englemann-Becker Model for Direct Instruction, and National Follow Through.

Stallings and Stipek (1986) provide us with a marvelous synthesis of research on early childhood teaching programs. Their review includes a description of long-term studies that included 12 preschool programs, 4 Head Start programs, the Perry Preschool program, and 2 follow-through programs. These programs have established a research base for early childhood educational programs. There are three important findings that should be shared: (1) family involvement enhances children's attitudes about school; (2) cognitive development is most likely to come from Montessori Methods, especially for 3- and 4-year olds; and (3) children in materials-oriented problem-solving curricula scored higher on nonverbal tests.

At least four studies have attempted to challenge Piaget's stages of cognitive development, projecting that elementary aged children are capable of conditional and logical reasoning, and even critical thinking (Arnold, 1938; Ennis, 1975; Roberge, 1970; Shapiro & O'Brien, 1970).

Hudgins and Edelman (1986) investigated the effects of an intervention on both teachers' and students' (fourth and fifth graders) critical thinking skills. They found that teachers were unable to alter their traditional styles of teaching but talked less, therefore providing more opportunities for the children to talk. Thus, the children began to give additional information and supportive statements to buttress their conclusions. However, there were no significant gains by the children on the Cornell Critical Thinking Test.

Subsequently, Hudgins and Edelman (1988) studied the critical thinking skills of fourth and fifth grade children using a Test of Critical Thinking designed by the researchers. The children in the experimental group, following eight lessons, scored significantly higher than those in the control group in problem solving, application of thinking skills, and quality of their responses. In summation, critical thinking skills were taught and learned, though the population consisted of 10- and 11-year olds. Although we are observing substantial progress in the development of early childhood programs, the research is lacking. Stallings and Stipek (1986) comment:

> Sadly lacking in early childhood education research are studies of thinking skills....We have made great strides in understanding more of the relationship between teaching young children and long-term learning effects. We hope the next decade will produce replicable studies and generalizable findings on the teaching of thinking skills in preschool and elementary school classrooms (p. 751).

Physical educators have studied movement characteristics, motor behaviors, motor programming and spatial representation, motor skills, self-concept, motor creativity, and motor learning in preschool and elementary aged children, but I found not one shred of empirical evidence supporting the acquisition of critical thinking skills of young children during movement (Broadhead & Church, 1985; Espenschade & Eckert, 1980; Gallagher & Thomas, 1984; Keogh & Sugden, 1985; Melville, 1988; Wickstrom, 1977; Zaichkowsky, Zaichkowsky, & Martinek, 1980).

Practical Suggestions

This portion of the presentation will provide you with some practical suggestions for helping children to think, maybe even critically, when engaged in movement. Even though our critical thinking research base is insufficient, and most of us would question the appropriateness of such skills with preschool children, we have two choices before us.

First, we can support the status quo, that is, continue to teach as we have always taught and not fret about cognitive skills. Certainly, we have enough to worry about when trying to help children become motorically skilled and physically fit. Besides, the research is lacking and we have other pressing programmatic concerns that need attention.

Second, we can do some critical thinking ourselves. We can begin to experiment with some rational and intuitive ideas or strategies borrowed from related research and successful practices, that we feel will help young children to think in a structured movement setting. Please be reminded that we can advocate either of the two curricular models for preschool children and still accomplish this goal. Furthermore, the goal can be accomplished without putting undue academic pressure on young children.

Educators know that when teaching children in physical education, thinking, feeling, and moving are coequal partners. Skillful movement requires skillful thought. Young children often learn through discovery and are typically movement hungry. These characteristics, combined with a child's innate desire for play, set the stage for finding exciting ways to learn. We must work toward precritical thinking skills or concepts that will lay a foundation for higher order processes.

These skills would include: classification or grouping; seriation; spatial relations; temporal relations; observation; problem-solving; goal setting; decision-making that involves choosing alternatives; identifying relationships and patterns; drawing if-then logical forms; and understanding cause-and-effect relationships. These thinking skills can be integrated into a movement based physical education program and would not be taught as a separate subject. The categories of spatial awareness, effort qualities, and relationships fit nicely with the aforementioned precritical thinking skills.

Learning Environment

Teachers can prepare the learning environment to provide a base for the development of precritical thinking skills. To do such involves rethinking the atmosphere for teaching and learning. For example, teachers should consider the following suggestions (Alvino, 1984; Barrell, Liebmann, & Sigel, 1988; Hendrick, 1980; Maxwell & Paulu, 1987).

1. Construct a movement environment where children are free to take risks, to try out alternative behaviors, and to use trial and error learning without being criticized. For example, I would encourage many different ways to move the body in personal space and general space without some preconceived notion of the better ways to move.

2. Select movement tasks that are within the child's range, but expect and allow for regression in growth patterns.

3. Encourage invention, fantasy, and self-reliance. These can be enhanced by supplying the environment with different types of materials, equipment, and diverse movement opportunities. For example, we could pretend that the children are dinosaurs looking for food in a high place (e.g., the outdoor play structures).

4. Use "matching" or comparing new information or movements with those they already know.

5. Somewhat related to matching, but a different thinking skill, involves paired associate activities. For example, movements up and down or over and under help young children to reinforce directions and relationships of the body in space.

6. Use "guided imagery" to teach the young child about movement. This can include a multisensory approach using touch, vision, hearing, and feeling.

7. During small group discussions, help children elaborate on how they feel when moving fast, at a low level, or in unison with a friend.

8. Encourage young children to set goals that are possible to achieve within a specific time frame. We can help them to determine what is working for them and what is not.

Pedagogical Behaviors

The way in which teachers interact with children is vital to developing precritical thinking skills. The tremendous gains in pedagogical research clearly tell us that the teacher is the most important variable in the learning environment. So what should effective early childhood educators do? First, teachers should have a repertoire of indirect and inquiry strategies for learning. I have found that guided, discovery problem solving, and exploratory approaches work best with young children (Mosston, 1981). When using these indirect or inquiry styles, both convergent and divergent thinking occur. Such flexibility can work toward meeting the individual differences in children. Children ages 3 and 5 cannot be expected to perform a motor pattern like an adult or even like each other. Roberton and Halverson (1984) offer the following insights:

> For both assimilation and accommodation to occur, children must engage in exploring and thinking about the movement problem at hand— in observing, trying, testing, and changing either the problem or themselves.... Then, [teachers] should help the child verbalize why it was efficient and effective (p. 10).

Indirect or inquiry teaching methods, where children have an opportunity to make decisions about their learning, provide both the freedom and responsibility necessary to enhance one's thinking skills. These approaches are especially useful for children who are not developmentally capable of refining a specific movement and need time for movement exploration. The appropriate use of problem solving, questioning, and exploration may assist children to think and therefore make value judgments about their own learning. Indirect strategies are not, however, a license for mindless movement. Indirect or inquiry styles of teaching require teacher reflection and critical thinking.

Rink's (1985) implications for learning motor skills are appropriate at this juncture. She suggests that the selection of tasks, clarity of presentation, and sequential development of tasks must be considered by teachers. Careful thinking and planning by teachers should pay dividends when children begin to move thoughtfully and skillfully.

Teachers might consider these strategies when planning movement lessons (Hess & Croft, 1981; McClenaghan & Gallahue, 1978; Riggs, Dodds, & Zuccalo, 1981; Roberton & Halverson, 1984; Schurr, 1975):

1. Praise frequently, especially the unusual responses to movement challenges.
2. Ask "what" versus "why" questions. For example, "What are some ways to move your body quickly?" This would be better than "Why should we move our bodies quickly?"
3. Observe what thinking strategies children use, and offer useful feedback. Encourage children to make a movement plan to include thinking before, during, and after attempting a task.
4. Encourage children to think differently and attempt alternative methods. This can be accomplished by using open-ended phrases such as "find a way," "show me," "who can be the first to think," "try to," "suppose you," "how else," "how many," etc. The children's responses might include doing, telling, or drawing a picture.
5. Explain, label, and identify the movement tasks. Pictures of athletes and others moving can stimulate thinking, teach vocabulary, and focus attention on detail.
6. Use individual movement tasks with the idea of working toward eventual group work and interaction. Small group discussions can be stimulating for children if handled in the proper manner. Try the Think-Pair-Share strategy.
7. Model behaviors that involve the precritical thinking skills.
8. Put many different types of questions to individuals and groups. Be prepared to wait.
9. Experiment with verbal cues and rehearsal strategies. Have the children think out loud or use self-talk.
10. Ask the students to verbally summarize what they have learned.

Teachers of movement can explicitly plan for precritical thinking skills in an atmosphere that is caring, sensitive, unhurried, and meaningful to children.

Educators' Role

My taxonomy of educators includes teachers, administrators, professional preparation personnel, and researchers. Each of these educators has a responsibility to thrust early childhood education into the year 2000. In addition, these professionals must collaborate and work toward a common agenda. One portion of this agenda should be the consideration of precritical thinking skills. If we want children to be active learners we must help them activate both their bodies and their minds. In doing so we must be careful of cramming or pushing academic skills for young children who are not ready. Our analogy in physical education is athletics. Critical or reflective thinking on our part is essential.

The skills and competencies needed by educators are varied, but those interested in young children should be creative, innovative, and open-minded. They should be knowledgeable of teaching strategies, curriculum development, motor learning and development, and evaluative procedures. Graham, Holt/Hale, and Parker (1987) suggest the following minimal competencies for teachers of movement:

1. Understand the progression and development of basic skill themes and movement concepts.
2. Learn to evaluate each child's generic levels of motor skill proficiency.
3. Develop skill in observing young children move.

Let us return to my initial question that resulted from teaching general and personal space to 5-year-olds. Did I in fact teach the children to think? I did use indirect methods and the children were creative and successful with their responses to my movement challenges. I want to answer the question with a resounding "Yes," but, in all honesty I was not conscious of many of the precritical thinking skills and literature that are presented here. Even though our best current measure of thinking skills in young children is teacher observation, we cannot claim that we teach critical thinking or precritical thinking yet.

Nevertheless, we can become familiar with the literature and trends, attend contemporary conferences, request staff development, establish partnerships with university faculty and researchers, carefully observe thinking patterns in young children, and begin rational experimentation. These experiments will take greater pedagogical awareness on the part of educators.

Can educators forge the linkage between moving and learning? Sure we can. Will early childhood educators be ready to tackle the issue of a thinking skills curriculum by the turn of the century? We should be and must be for no other reason than children are why we as educators exist.

References

Alvino, J. (1984). Nurturing children's creativity and critical thinking skills. *Education Digest*, 49(2), 48-49.

Arnold, O.L. (1938). Testing ability to use data in the fifth and sixth grades. *Educational Research Bulletin*, 17, 225-259, 278.

ASCD Early Childhood Education Policy Panel. (1988). Analysis of issues concerning public school involvement in early childhood education. In C. Warger (Ed.), *A resource guide to public school early childhood programs*, 95-115.

Barrell, J., Liebmann, R., & Sigel, I. (1988). Fostering thoughtful self-direction in students. *Educational Leadership*, 45(7), 14-17.

Bereiter, C. (1984). How to keep thinking skills from going the way of all frills. *Educational Leadership*, 42(1), 75-77.

Beyer, B.K. (1984a). Improving thinking skills—Defining the problem. *Phi Delta Kappan*, 65(7), 486-490.

Beyer, B.K. (1984b). Improving thinking skills—Practical approaches. *Phi Delta Kappan*, 68(7), 556-560.

Beyer, B.K. (1988). Developing a scope and sequence for thinking skills instruction. *Educational Leadership*, 45(7) 26-30.

Bloom, B.S. (Ed.). (1974). *The taxonomy of educational objectives: Affective and cognitive domains*. New York: David McKay.

Boucher, A. (1988). Good beginnings. *Journal of Physical Education, Recreation and Dance*, 59(7), 42.

Broadhead, G.D., & Church, G.E. (1985). Movement characteristics of preschool children. *Research Quarterly for Exercise and Sport*, 56(3), 208-214.

Brown, J.L. (1983). On teaching thinking skills in the elementary and middle school. *Phi Delta Kappan*, 64(10), 709-714.

Chance, P. (1986). *Teaching thinking*. Curriculum Report of the National Association of Secondary School Principals, 15(5). (ERIC Document Reproduction Service No. 271 816).

Cryan, J.R., & Surbeck, E. (1979). *Early childhood education: Foundations for lifelong learning*. Bloomington, IN: Phi Delta Kappa.

Curtis, S.R. (1987). New views on movement development and the implications for curriculum in early childhood. In V. Seefeldt (Ed.), *The early childhood curriculum: A review of current research*, pp. 256-277.

de Bono, E. (1983). The direct teaching of thinking as a skill. *Phi Delta Kappan*, 64(10), 703-708.

de Bono, E. (1984). Critical thinking is not enough. *Educational Leadership*, 42(1), 16-17.

Elkind, D. (1972). Misunderstandings about how children learn. *Education Digest*, 37(9), 40-42.

Elkind, D. (1988). The resistance to developmentally appropriate educational practice with young children: The real issue. In C. Warger (Ed.), *A resource guide to public school early childhood programs* (pp. 53-62).

Ennis, R.H, (1975). Children's ability to handle Piaget's propositional logic: A conceptual critique. *Review of Educational Research*, 45, 1-41.

Ennis, R.H. (1985). Goals for critical thinking/reasoning curriculum. *Educational Leadership*, 45(2), 45-48.

Espenschade, A.S., & Eckert, H.M. (1980). *Motor development* (2nd ed.). Columbus, OH: Charles E. Merrill.

Gabbard, C., LeBlanc, B., & Lowry, S. (1987). *Physical education for children: Building a foundation*. Englewood Cliffs, NJ: Prentice-Hall.

Gabbard, C. (1988). Early childhood physical education. *Journal of Physical Education, Recreation, and Dance*, 59(7), 65-69.

Gallagher, J.D., & Thomas, J.R. (1984). Rehearsing strategy effects on developmental differences for recall of a movement series. *Research Quarterly for Exercise and Sport*, 55, 123-128.

Gallahue, D. (1982). *Understanding motor development in children*. New York: John Wiley & Sons.

Gallahue, D. (1982) *Developmental movement experiences for children*. New York: John Wiley & Sons.

Graham, G., Holt/Hale, S., & Parker, M. (1987). *Children moving* (2nd ed.). Palo Alto, CA: Mayfield.

Heiman, M., & Slomianko, J. (1985). *Critical thinking skills*. Washington, DC: National Education Association.

Hendrick, J. (1980). *Total learning for the whole child*. St. Louis: C.V. Mosby.

Hess, R.D., & Croft, D.J. (1981). *Teachers of young children*. Boston: Houghton Mifflin.

Hudgins, B.B., & Edelman, S. (1986). Teaching critical thinking skills to fourth and fifth graders through teacher-led small-group discussions. *Journal of Educational Research*, 79(6), 333-342.

Hudgins, B.B., & Edelman, S. (1988). Children's self-directed critical thinking. *Journal of Educational Research*, 81(5), 262-273.

Johnson, T.W. (1984). *Philosophy for children: An approach to critical thinking*. Bloomington, IN: Phi Delta Kappa.

Joyce, B. (1985). Models for teaching thinking. *Educational Leadership*, 42(8), 4-7.

Katz, L.G. (1988). Engaging children's minds: The implications of research for early childhood education. In C. Warger (Ed.), *A resource guide to public school early childhood programs* (pp. 32-51).

Keogh, J.F., & Sugden, D. (1985). *Movement skill development*. New York: Macmillan.

Lipman, M. (1988). Critical thinking—What can it be? *Educational Leadership*, 46(1), 38-43.

Logsdon, B., Barrett, K., Broer, M., McKee, R., & Ammons, M. (1977). *Physical education for children: A focus on the teaching process*. Philadelphia, PA: Lea & Febiger.

Maxwell, L., & Paulu, N. (1987). *Eight pointers on teaching children to think*. Research in Brief from the Office of Educational Research and Improvement. (ERIC Reproduction Service No. 277 992).

McClenaghan, B., & Gallahue, D. (1978). *Fundamental movement: A developmental and remedial approach*. Philadelphia: W. B. Saunders.

Melville, D.S. (1988). Thinking and moving. *Strategies*, 2(1), 18-20.

Mosston, M. (1981). *Teaching physical education*. Columbus, OH: Charles Merrill.

Nickerson, R.S. (1984). Kinds of thinking taught in current programs. *Educational Leadership*, 42(1), 26-36.

Paul, R.W. (1984). Critical thinking: Fundamental to education for a free society. *Educational Leadership*, 42(1), 4-14.

Paul, R.W. (1985). Bloom's taxonomy and critical thinking instruction. *Educational Leadership*, 42(8), 36-39.

Penrose, W.O. (1979). *A primer on Piaget*. Bloomington, IN: Phi Delta Kappa.

Postman, N. (1985). The disappearance of childhood. *Childhood Education*, 61(4), 286-293.

Raths, L.E., Wassermann, S., Jones, A., & Rothstein, A. (1986). *Teaching for thinking: Theory, strategies, and activities for the classroom*. New York: Teachers College Press.

Riggs, M.L., Dodds, P., & Zuccalo, D. (1981). *Early childhood*. (Basic Stuff Series II). Reston, VA: AAHPERD.

Rink, J. (1985). *Teaching physical education for learning*. St. Louis: Times Mirror/Mosby.

Roberge, J.J. (1970). A study of children's abilities to reason with basic principles of deductive reasoning. *American Educational Research Journal*, 7, 583-596.

Roberton, M.A., & Halverson, L.E. (1984). *Developing children: Their changing movement: A guide for teachers*. Philadelphia: Lea & Febiger.

Rose, J. (1986). Critical thinking: Have we over-complicated the issue? *Thrust*, 15(6), 21-24.

Schurr, E. (1975). *Movement experiences for children: A humanistic approach to elementary school physical education*. Englewood Cliffs, NJ: Prentice-Hall.

Seefeldt, V. (1985) Tomorrow's kindergarten: Pleasure or pressure? *Principal*, 64(5), 12-15.

Shapiro, B.J., & O'Brien, T.C. (1970). Logical thinking in children ages six through thirteen. *Child Development*, 41, 823-829.

Siedentop, D., Herkowitz, J., & Rink, J. (1984). *Elementary physical education methods*. Englewood Cliffs, NJ: Prentice-Hall.

Stallings, J.A., & Stipek, D. (1986). Research on early childhood and elementary school teaching programs. In M.C. Wittrock (Ed.), *Handbook of research on teaching* (pp. 727-753).

Stanley, S. (1977) *Physical education: A movement orientation*. Toronto: McGraw-Hill.

Sternberg, R.J. (1985a). Teaching critical thinking, Part 1: Are we making critical mistakes? *Phi Delta Kappan*, 67(3), 194-198.

Sternberg, R.J. (1985b). Teaching critical thinking, Part 2: Possible solutions. *Phi Delta Kappan*, 67(4), 277-280.

Sternberg, R.J. (1987). Teaching critical thinking: Eight easy ways to fail before you begin. *Phi Delta Kappan*, 68(6), 456-459.

Wasserman, S. (1987). Teaching for thinking: Louis E. Raths revisited. *Phi Delta Kappan*, 68(6), 460-466.

Wickstrom, R.L. (1977). *Fundamental motor patterns* (2nd ed.). Philadelphia: Lea & Febiger.

Zaichkowsky, D.L. Zaichkowsky, L.B., & Martinek, T.J. (1980). *Growth and development: The child and physical activity*. St. Louis: C.V. Mosby.

A Child's View of Fairplay

Brian J. Entzion

Where there is activity there is conflict. In the words of Newton, "For every action, there is an equal and opposite reaction." At River Heights Elementary School, where there is quite a lot of activity, teachers and students are trying to prove Newton wrong. In competitive environments, cooperation and fairplay are being stressed. "You must be a good sport." "Be fair." "Share with . . . ." These are a sampling of the comments that we hear in the hallways and gymnasiums every day.

Nevertheless, in spite of these good intentions and efforts to promote ethical behavior, I wondered if the elementary students at River Heights had a personal understanding of good sportslike conduct. Had they merely become familiar with the words, or could they provide me with actual examples of this behavior? I asked them to tell me what they thought good sportsmanship is, and as you will see, their answers were diverse. But they fell, roughly, under four categories: respect for authority and the rules, proper responses to winning and losing, sensitivity to others, and being the best that you can be.

Respect for Authority and the Rules

"Pick up the mats after kickball."

"If you get tagged . . . you're it."

"Don't cheat."

"Don't drink at the fountain when the game is on."

"Goaltenders in soccer should say when the ball crosses the line."

"[You] shouldn't chase unless you're playing a game."

"Help your teacher."

These responses appear to indicate that students understand that sportslike conduct has to do with following the rules (of the game and/or teacher) and helping the teacher in some way. They suggest that promoting the idea of adherence to the letter and spirit of the rules would provide a base on which to build a concept of fairplay. They remind us that rules are intended to provide structure and safety in what sometimes appears to be a haphazard environment. They indicate that rules can help improve areas of classroom management by providing students with some of the administrative responsibilities of games such as choosing teams, preparing equipment, and resolving minor conflicts.

We must remember, however, that this fragile concept can be eroded through poor coaching, mimicry, and manipulation. The coach who "bends" the rules a little; takes advantage of "loosely" officiated high school, collegiate, and professional sports; and creates rules that are designed to manipulate students into doing his or her work can adversely affect students' respect for rules and authority.

Proper Responses to Winning and Losing

"Don't get mad after losing."

"Shake hands at the end of the game, whether you win or lose."

"When you lose, you should be happy."

"When you lose, don't yell."

"Don't start crying every time you don't win."

"Try for first place."

"Don't brag and say that you're better than other people when you win."

"Don't be mad if you're on a bad team."

"Don't make excuses when you lose."

"Don't say `Boo' when you're losing or when something bad happens to your team."

"If you lose one game, don't call your bet off for the next game."

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These statements would suggest that even elementary age children understand the importance our society places on winning. But it is also clear that they are familiar with the rules of conduct that are associated with the end of the game. These housekeeping rules can make life much easier for the instructor in the gymnasium by by minimizing conflicts associated with victory and defeat.

These statements also indicate that young children know that losing is frequently associated with bad behavior. Losers "boo," call off bets, make excuses, and get mad. Unfortunately, efforts of some physical educators to downplay the importance of winning and losing are nullified by "more knowledgeable" significant others—the 18-year-old soccer coach who is building a "dynasty," the father who once played ball, and the heroes on cable television. Nevertheless, physical educators can create environments and objectives that allow students to compete against themselves instead of against others.

Guidelines for Good Sportslike Conduct

1. Don't cheat.
2. Don't start crying every time you don't win.
3. Don't make excuses when you lose.
4. Try for first place.
5. Don't hurt anybody.
6. Take turns.
7. Don't brag.
8. Don't yell at teammates when they make mistakes.
9. Don't tell people that they are no good.
10. Don't kick anyone in the stomach.

From the students of River Heights Elementary School, East Grand Forks, Minnesota.

Sensitivity to Others

"Don't hurt anybody."

"Don't yell at teammates when they make mistakes."

"If someone falls and gets hurt, tell a grown-up."

"Don't kick anyone in the stomach."

"Take turns."

"Give the other people a chance."

"If someone gets hurt, get an ice bag."

"If someone is on the monkey bars, wait until they're done."

"Don't tell people that they are no good and they can't play."

"Don't call [people] names."

"Don't pull hair when you're tagged."

"[You] shouldn't try to punch anyone in the mouth."

These statements indicate that elementary students have a good idea of how they should behave toward one another. But, as we all know, they do not always live up to these standards. At school and at home they probably hear "Don't!" but what do they see?

They see their parents resolve conflicts by verbally (and sometimes physically) abusing one another. They see professional and collegiate athletes resolve conflict through fighting. And they see actors on television and at the movies resolve their differences with violence.

Physical educators cannot control factors outside of school, but they can influence their own environments. Everybody wants attention and everyone likes to be recognized for a job well done. A conscious effort to be more supportive and positive will help to reduce the number of times the word "don't" is needed.

Being the Best You Can Be

"To get good grades and to be your best."

"Don't be a quitter."

"You should always run as fast as you can."

These three students may perceive success as something that many of us do not entirely appreciate or understand. Their responses appear to indicate that as long as they do their best, they will be successful. But how can this be? We know that success is determined by the number of points on the scoreboard . . . or do we?

It could be that getting straight As, outscoring others on achievement tests, and/or setting a new school record in the 50-meter dash are not prerequisites of success. Perhaps physical educators should help students measure success more on personal performance than competitive outcomes. This might provide a "winning season" for all students.

Conclusions

The responses recorded here indicate that the elementary students of River Heights School have a good idea of what fairplay is. However, it is interesting to note that their understanding is often conveyed through the use of such negative constructs as "don't" and "shouldn't." Could it be that the only time they learn about good behavior is when an adult corrects them for displaying poor behavior? Possibly, we can do a better job of creating environments that will foster good behavior. Fairplay is promoted not only by picking up the pieces after a conflict occurs but also, and perhaps more effectively, by preventing the conflict from occurring in the first place.

Editor's Comments

The above essay appeared in the Fairplay column in Strategies, *which is edited by Scott Kretchmar of Penn State University. Following are his comments on the article.*

Mr. Entzion reminds us that even children—and possibly, especially children—know what it means to behave well. One does not need a Ph.D. to have a good grasp of what is right and wrong, fair and unfair, loving and hateful.

This essay reminded me of Robert Fulghum's little book entitled *All I Really Need to Know I Learned in Kindergarten.* Fulghum (1989) argued that "wisdom [is] not at the top of the graduate-school mountain, but there in the sandpile at Sunday School" (p. 6). He playfully asked his readers to consider "what a better world it would be if we all—the whole world—had cookies and milk about three o'clock every afternoon and then lay down with our blankies for a nap. Or if all governments had as a basic policy to always put things back where they found them and to clean up their own mess" (pp. 7-8).

Critics have said that Fulghum is a romantic and that the world is more complicated than this. Some could say the same thing about the "do's" and "don'ts" reported by Entzion's students. They are cute, it could be claimed, perhaps even refreshingly straightforward; but they are hopelessly naive.

I am not so sure. To test out my sense that these elementary students have a grasp on more than we might suspect, I selected ten of my favorite guidelines and submit them to you as a fairly comprehensive set of guidelines for good sportslike conduct (see box, p. 107). Have you read many recommendations that say it any better? If all athletes lived by these norms, we would not see much of the ethically uncertain behavior that we now witness on our sandlot, college, and professional athletic fields.

I agree with Fulghum that ethics is less complicated than many make it out to be. And it is often as children that it is experienced this way.

I am not saying that youth sports are entirely innocent or pure and athletics for teenagers and adults are wholly cynical and corrupt. Far too much counter-evidence exists at both levels for this to be the case. Yet, a trend from simplicity and possibly higher ethics to complexity and lower ethics as players move up in age and competitive level can undoubtedly be observed. Consider some of the following contrasts.

As youth we know that it is wrong to break game rules.

As adults we are no longer sure. (There are some rules that are broken regularly and intentionally, and we have been taught that it is strategically smart to do so.)

As youth we know that it is wrong to harm anyone in games.

As adults we are no longer sure. (If an opponent isn't up to the test, perhaps he or she should not be "out there." Moreover, there are certain dangerous techniques of intimidation that are fully "part of the game.")

As youth we know that umpires or game officials should be respected and obeyed.

As adults we are no longer sure. (While we must abide by officials' decisions, we have been taught how to manipulate these people and even trick them into making wrong calls in our favor.)

As youth we know that games are special events, set quite apart from other daily comings and goings at school and home.

As adults we are no longer sure. (What is at stake at play is very much like what is at stake in the rest of life. We often finish games more psychologically exhausted than when we started them.)

Again, it would be inappropriate to romanticize the play of children and attribute a purity to it that it does not have. Nevertheless, there is probably a degree of simplicity, care, concern, and unabashed joy present in youthful play that declines as competitors mature.

Therefore, thanks are due to Mr. Entzion and his elementary school children for reminding us that all we ever need to know we probably learned in youth sports, and, more specifically, that we should pick up our mats after kickball and wait if someone else is on the monkey bars.

Reference

Fulghum, Robert. (1989). *All I really need to know I learned in kindergarten: Uncommon thoughts on common things.* New York: Villard Books.

Quality Physical Education Programs: Cognitive Emphases

Joyce K. Espiritu

In the past 25 years efforts have been made to include an increasing variety of cognitive learning experiences in school-based physical education programs. In some instances, paper and pencil tasks and written examinations covering specific activity units may have been introduced to make our programs appear to be more "academic" in nature or to justify physical education programs as an integral part of the total school curriculum. At the elementary level, additional learning experiences were designed to "integrate" concepts from other subject area disciplines into play and movement activities. For example, students would be asked to move their bodies into the shape of a letter of the alphabet.

Recently two major cognitive emphases have been implemented to a limited extent in physical education programs. The first emphasis has included the area of wellness concepts and physical fitness. This emphasis seems to have been a result not only of efforts within our profession but also of societal interests and goals. While adults in our society appear to be more concerned about health and physical fitness than ever before, the actual physical fitness scores of children presently enrolled in schools are lower than the scores of previous years. The second emphasis is in the area of disciplinary knowledge and is the direct result of efforts within our profession to identify and specify the concepts that comprise the body of knowledge, or disciplinary knowledge, in the field of physical education.

To determine the emphasis that was placed on the teaching of cognitive concepts in the St. Louis area, a survey of elementary physical educators was conducted (Loughrey & Espiritu, 1984). The respondents were asked to indicate which of the listed cognitive concept areas were taught in their curriculum and the way in which the information was presented to the learner. The respondents were also asked to indicate the types of resources used by students during instruction in physical education.

The results indicated that the respondents professed to teach cognitive material in a wide variety of content areas. Of the nine groupings of specific content areas listed, the sports skill cognitive content area received the highest level of cognitive instructional emphasis. More than 90 percent of the respondents indicated that they taught sports skill content, such as court/field areas, terminology, skill technique, rules, scoring, and strategy.

Nearly 70 percent of the teachers indicated that they taught social cognitive content, especially respect for authority, respect for individuals, the role of competition and cooperation, leadership roles, socialization, and responsible individual behavior.

The only other area in which a majority of the teachers indicated they taught cognitive content was in the physiology of exercise area. They indicated that specific information—exercise techniques, warm up and cool down, benefits of exercise, exercise effects on the cardiovascular system, flexibility development, and strength development—was commonly taught in their programs.

Overwhelmingly, the teachers indicated that the cognitive information was generally presented to students through the use of discussion and demonstration. In a few instances, written materials were provided to students. Rarely were worksheets, learning packets, or computer programs used to present the cognitive material.

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Intentional Cognitive Learning

As was discovered in the study of cognitive emphasis, incidental learning was the most prevalent method of teaching cognitive concepts in elementary physical education classes. Such incidental learning was likely to occur most at the beginning of an activity unit, as the teacher took time to explain the techniques, terms, rules, etc. about the new activity. The information was trusted to memory after one exposure, although reinforcement might have taken place in later classes if the teacher perceived that the information was forgotten. In most cases, few formal efforts were made to ensure that the knowledge was actually understood so that it could be applied in similar or different settings.

Cognitive learnings are integral to the development of a physically educated person. The primary goal in physical eduction is to produce moving, thinking, feeling persons who will engage in active lifestyles. It is in the integration of the psychomotor, cognitive, and affective behaviors that this goal can best be achieved.

As described by Thomas and Gallagher (1987), cognition is important in motor skill learning and performance. Each psychomotor movement is based on cognitive functioning. Although a skill, a movement, or a combination of movements is practiced until it becomes a nearly automatic response, the actual acquisition of the skill and the attention to cues and stimuli during each movement is based on cognition. Therefore, it is necessary to define and refine the cognitive concepts that relate to skill acquisition and performance in ways that allow physical educators to teach those concepts to children in intentional, not incidental, learning experiences.

Similarly, it is important that students in physical education also understand the reasons for, the benefits of, and the ways to properly engage in a healthy and active lifestyle. Instead of hoping that the incidental learnings in this area aid in the development of such a lifestyle, it is necessary to plan and implement intentional learning experiences related to fitness and wellness concepts, much of which can be drawn from our disciplinary knowledge.

Already available for use and implemented in some programs are sources such as AAHPERD's *Basic Stuff Series*. The Series I books (1987) describe and discuss the concepts in six separate disciplinary areas: Exercise Physiology, Humanities in Physical Education, Kinesiology, Motor Development, Motor Learning, and Psycho-Social Aspects. The companion Series II books (1987) are designed to aid teachers in the design and implementation of intentional, planned learning experiences related to cognitive development. Other commercially designed materials and texts, such as Corbin's *Fitness for Life* (1985), are being used in a growing number of physical education programs.

To fully integrate cognitive learning experiences into the curriculum, it is important that they be formally included in the school district's curriculum guide in physical education. The specific cognitive concepts to be taught and learned at each grade level should be specified in the guide's scope and sequence chart. If using a competency-based approach, as is being mandated in many states, the concepts will be included as measurable learner outcome statements. These will then result in the development of intentional learning experiences and appropriate materials to be used in transmission and retention of the information. In addition, provision for evaluation and reinforcement of these learnings will be specified in the curriculum framework.

Applications for Implementation

What began as a search for an answer to the problem of overcrowding in physical education classes led to the realization that cognitive learnings can greatly enhance the quality of physical education programs. Initially, cognitive learning experiences were used to engage students in worthwhile activities during those times that they were not able to participate in physical activities because of a lack of space. In an effort to keep the students interested and occupied, it was discovered that they were curious about learning concepts related to their own bodies and to physical activity performance.

The initial use of cognitive learning involved the implementation of learning centers (Espiritu & Loughrey, 1985). One advantage was that the centers are individualized, so that students can work independently and with a minimum of teacher involvement. That enabled the instructors to work primarily with those students who were engaged in physical activity. As proficiency was developed in the designing and writing of learning centers and in seeing the response from the students to such experiences, learning center units of instruction were then incorporated into the curriculum. As it became evident that the physical education of our students was being enhanced through intentional cognitive learnings, it also became apparent that acceptance of the program was growing. It became easier to influence administrators regarding the values of physical education and to justify the purchase of equipment and materials for our program.

Learning centers were implemented in a wide variety of cognitive concepts areas. Students explored the size of various parts of their bodies through a learning center entitled "How Big?" Biomechanical concepts were included in learning centers entitled

> The primary goal in physical education is to produce moving, thinking, feeling persons who will engage in active lifestyles. It is in the integration of the psychomotor, cognitive, and affective behaviors that this goal can best be achieved.

"Mass vs. Velocity" and "Increasing Projectile Force." The learning center on "How Does Your Heart Rate?" explored the concepts of resting heart rate, elevated rate resulting from light, moderate, and heavy exercise, and recovery rate. Wellness concepts, including the relationship between diet, exercise, and weight control, have been developed into exciting and interesting learning centers. A study of disabling conditions, such as blindness, served as the basis for learning centers intended to have the students understand the ways that unsighted persons can move and conduct normal lives.

In addition to the use of originally-developed learning centers, selected health-related fitness software programs from the Minnesota Educational Computing Consortium (1982) and the commercially produced Health Activity Program (1979) were used. Each month a new bulletin board display incorporates certain cognitive information with information relating to the physical activities the students are engaging in during that period of time. Weekly, a "PE Question of the Week" is posted on the bulletin board. Students who correctly answer the quiz receive special recognition and, in some cases, a small prize.

Cognitive information can also serve as the basis for intervention programs. In an effort to use the results of health-related fitness assessments to bring about personal improvement, a pilot intervention program was designed for children found to be overfat and underfit. Using an originally designed and developed Parkway Personal Wellness Profile computer program, students whose assessments met specified criteria for being overfat and underfit were identified. The pilot program included a special monthly meeting for parents of the children who participated in this voluntary program. The parents' meeting was designed to provide information relating to the role of exercise and diet in weight control and the development of physical fitness. In addition to regularly conducted physical education classes, the children engaged in a 45-minute class each week that included cognitive information development, increasing levels of physical activity, and opportunities to discuss feelings related to self-concept.

An indication of the level of success achieved in this program was evidenced following the fall administration of the health-related fitness test. Of five fifth-grade girls who had taken part in the program as fourth-graders, four had raised their fitness scores or lowered their percent of body fat to the point that they no longer qualified for the intervention program. The most gratifying point is that each of them asked if they could continue in the program, as it had been such an enjoyable learning experience.

There are many reasons that justify having a strong cognitive emphasis in physical education programs. Certainly activity time is valuable and children want to participate in physical activity. However, the quality of that participation and the benefits that result from knowing, as well as doing, are equally important. To produce a moving, thinking, feeling person who is truly physically educated, well-defined intentional learning experiences must be included in the physical education program.

References

AAHPERD. (1987). *Basic stuff, Series I and II.* Reston, VA: AAHPERD.

Corbin, C. (1985). *Fitness for life*. Dubuque, IA: Wm. C. Brown Co.

Espiritu, J., & Loughrey, T. (1985). The learning center approach to teaching in physical education. *The Physical Educator*, Oct., 121-128.

Health Activity Program. (1979). A series of learning kits relating to fitness concept and cognitive concept development, produced by Hubbard, P.O. Box 104, Northbrook, IL 60063.

Loughrey, T., & Espiritu, J. (1984). The emphasis placed on the teaching of cognitive concepts in elementary physical education. Paper presented at the 2nd National Conference on Physical Education for Children, Orlando.

Minnesota Educational Computing Consortium. (1982). St. Paul, MN. Various software diskettes and instructional manuals on health and fitness.

Thomas, J., & Gallagher, J. (1987). Memory development and motor skill acquisition. In V. Seefeldt & P. Vogel (Eds.), *Physical activity and well-being*. Reston, VA: AAHPERD.

Listening to Children—

Fathoming Feelings in Physical Education

Judith B. Carlson

Do you ever wonder what your students feel about their movement experiences? Do you ever ask them and take time to listen to what they say? Most physical educators agree that children's self-esteem is important. They acknowledge a special responsibility to help children become aware of their moving bodies and their feeling selves.

Education has re-embraced humanism, emphasizing the importance of the concept of self. By acknowledging children's concerns for themselves, we recognize and respect them

The most effective teachers are those capable of helping students understand the nature of the affective experience. As Dobson stresses, educators "can contribute greatly to the self-respect of the next generation if we can genuinely empathize with children—see what they see, hear what they hear, and feel what they feel."[1]

Sensitivity to affective behavior is needed in physical education. Physical educators, long concerned with cognitive and motor teaching tasks, have not fully attended to the affective aspects of student performance. A deliberate plan for attitude development is essential, however, and physical education is a natural setting for studying affective behaviors.

To understand students better is to collect and use information about their needs, interests, capabilities, and understandings. Continuous feedback and evaluation throughout learning experiences helps both teacher and learner reveal and clarify feelings, actions, purposes, and thoughts. In seeking answers to how children feel in various situations, Orlick and Botterill demonstrate that adults are often unaware of what children are feeling because they seldom sit down and talk with them. They urge that adults learn from children by listening to what they say and by observing closely how they respond. "Children are perceptive and have a tremendous amount to offer if they are given an opportunity to express their views. It is extremely important for adults to communicate with children in order to better understand their perspective."[2]

Logsdon et al. advocate that students become aware of the meaning, significance, feeling, and joy of movement as performers and observers through unifying work in the affective, motor, and cognitive domains.[3]

Inquiry into children's personality is necessary. The formation of attitudes and values constitutes a critical dimension of child development. Because affective outcomes are integral to school experiences, it is essential to describe children in terms of how they feel about their experiences as well as what motivates them.

In an effort to assess the personal meaning and significance of selected movement experiences of second

Drawing by second grade physical education student

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graders, the writer probed the affective responses of each child. Self-report techniques used in this study—writing, discussion, and drawing—elicited children's affective responses to their "gym" experience.

The examples illustrate children's spontaneous, unpredictable, and highly personal responses. The questions which stimulated the responses precede them.

Body Awareness

Describe yourself in as many ways as possible.

I have red, curly hair, brown eyes, and my favorite color is red or pink. I love to play with balls and make up games.

I have brown eyes. I am fat. I have an outie belly button. I am sun-tanned. I have blue tennis shoes. I have a scar on my arm. I have eight teeth missing and another one loose.

I like myself very much and I like the way I move.

I like my body because . . .

My stomach muscles do the sit-ups and running, my arms do the hanging on the bar, and that makes me feel good.

I can wiggle every part of it.

It moves the way I want it to, so I feel really good.

If you really don't care about what you do and what you're like, and what you wear, fitness doesn't matter, but I care what I do and what I look like. I like to dress nice and fix my hair and look good. Then, I'm fit.

It is special and different from all others.

It can move, it is strong, and it is mine.

Physical Growth

Describe your feelings about your body.

This year I am a few inches higher. I've changed a lot. I've improved in kicking and throwing. I'm much faster. I'm getting to be a good-looking kid.

I always do my very best. It's getting easier now. I can kick balls farther, and I'm better on the hurdles. I have stronger legs and I am a little taller.

I used to be a really slow runner, now I am better. I am not afraid of some things any more, and I am not as shy and quiet. I'm much stronger in both my arms and legs.

I'm bigger and stronger. I can climb better.

I practice everything and then I see myself get better.

Physical Appearance

Look in the mirror at your whole self. What do you like? Dislike? How would you like to look?

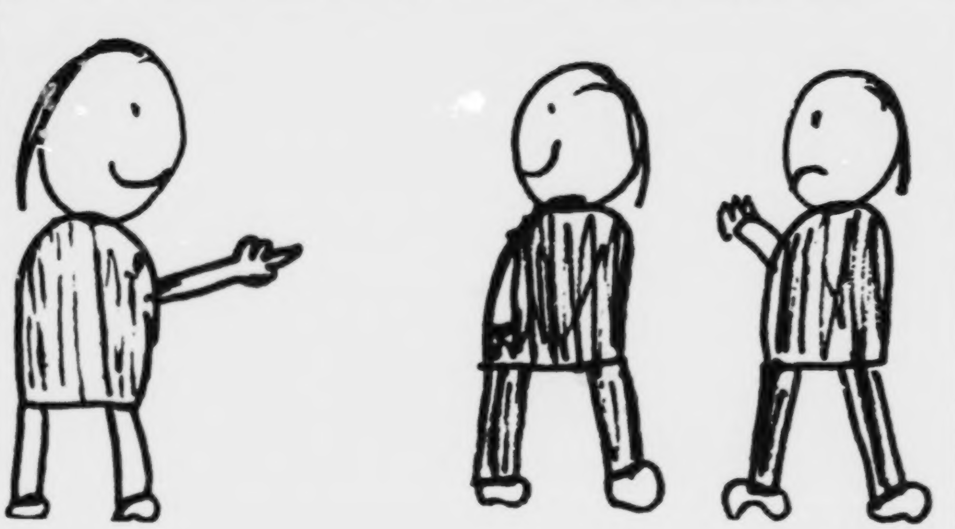
I do not like about me having red cheeks and dimples, and being little.

I see a strong boy, a good athlete, a fast runner. I just wish my face didn't seem so crooked.

I'm very happy with my whole body in gym now. I just got new tennis shoes. They're soft and fuzzy inside, and they make my feet run faster. I couldn't run in my old ones 'cuz the bottoms were too smooth and my toes were all curled up.

I don't like my body. I know I can run fast and I have a lot of movements, but I don't like my face. I don't think it's pretty. I hope it changes. I sometimes like being small. I can

When we pick teams for games, I have no particular feeling except that I hope I get picked.



Drawing by second grade physical education student crawl under things, run fast, and jump quickly, but it's bad when people tease you about being small.

I feel pretty good about my body in gym.

I feel good about moving, even if maybe I don't look that great. I can really do much with my legs. I can't do that much with my arms and hands yet.

I have crutches. At first they were fun, but I feel bad when everyone is playing and I can't. I feel like just trying, but I might hurt myself if I take a chance. It is lots different using crutches. I'll be glad not to have to use them. I'm not physically fit anymore. Without exercise you get weaker.

I have one problem with my body in gym. It tells me "no" in dance stuff. It's okay for others, but not for me. I don't know why, 'cuz I don't have trouble in anything else in gym.

I really think my body can do just about anything I want it to. I think a lot of my body because it does everything that I want it to do. I'm lucky to have it. Everyone is lucky to have a strong, healthy body, and I sure do.'

The second graders' responses clearly revealed a valuing of the physical self. With regard to awareness of the body, physical growth, and physical appearance, most children responded with strong, positive feelings about their physical selves. They preferred the mesomorphic body build which they associated with a strong, healthy body and an athletic appearance. They described their feelings about their own bodies in terms of growth and development. Many compared themselves with their younger selves, and described their personal growth and increasing efficiency. Their responses suggested the importance they placed on physical appearance and attractiveness in getting along with others and feeling satisfied with themselves.

Content of Physical Education

Many questions were designed to determine the children's feelings about the content of their physical education classes, which consisted of four components: body, space, effort, and relationship. The children's responses reflected experiences in movement which gave them opportunities for creativity, decision-making, and discovery.

Body

Describe the feeling of hanging upside down or being downside up.

Weird!
The lights seem to be on the floor.
It's like everybody is standing on his head.
It looks like kids are walking on the ceiling.

Running makes me feel . . .

Hot.
Sweaty.
Tired.
Achy.
Thirsty.
Dry in the throat.
Good on the inside.
I like to run because it leads to lots of other games.
I can run fast, smooth, and steady.
Backwards and forwards.
Crooked and straight.
I can run slow.
I can run.

Running makes me feel good and then it hurts. My throat feels funny and dry. I feel so fit too, and my legs, feet, and arms—they make me feel good when I am running. I feel very, very good when I am running on the track and in the gym, and the breeze makes me feel good too. My legs feel like they're gonna fall off . . . and curly, and they just feel very, very funny. I feel the good breeze on me again and it makes me feel good.

Kicking a ball a long distance makes me feel . . .

I'm proud.
It's really a great feeling.
It's hard.
If I could do it, it would feel really great!
I can do it!
It doesn't go very far.
I must use a lot of force.
It takes a lot of practice.

Space

When someone invades my personal space, I feel . . .

It cuts me off.
Oh, so what? I'll just keep moving and watch out.
No one should be in my space. It just takes control.
I'll share my space.

Effort

Describe your feelings when you are changing directions while moving.

It's very fun to do.
It makes me dizzy.
It's uncomfortable.
You have to be ready and fast.
Listening carefully is a good idea.

Moving and stopping very suddenly makes me feel . . .

It's fun.

It is such a surprise.

It's like a game. You turn the music on to move, or signal on the drum. Stop it, boom it, now everyone stay still!

It's scary.

Forms of Movement

Do you prefer to watch or play games? Why?

Watching is boring.

Playing is the only way to really learn.

I for sure prefer to play because it is more fun, even if I get sweaty.

Are you among the last to be chosen for games? Why?

Yes, and I don't know why.

I'm probably just not good.

Yes, because I am not popular.

People like me so I don't have to worry.

I'm usually the first chosen 'cuz I'm a good player.

I'd feel bad if I was picked among the last, 'cuz that means I'm kinda bad as a player.

When we pick teams for games, I feel . . .

Happy, excited, really good, it's fun.

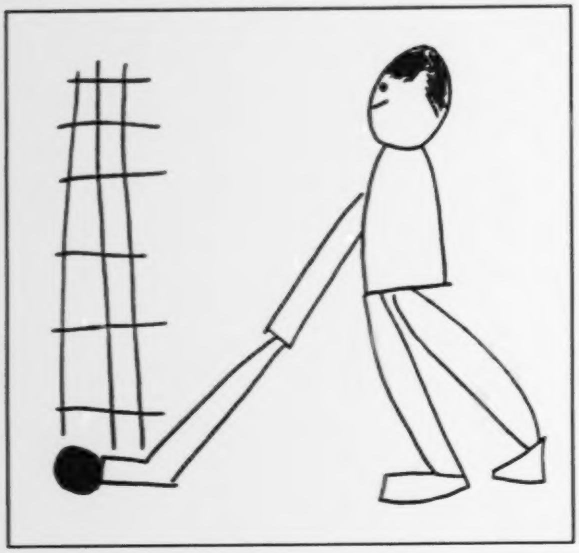
Bad, 'cuz no one wants me.

Bad, 'cuz I might be on a bad team.

Bored.

Terrific! I love playing team games.

My favorite thing is striking with the hockey stick.



I need my team because . . .

I couldn't do it alone.

I'm not the best so I need the help of the others.

I need a team because I want to work with others to help me with the rules and the playing.

I couldn't do it without my team. It wouldn't even be fair.

Describe your feelings about some of your favorite game activities.

I like to play with the different balls. They are so much fun and I learn so much.

I like it when we make up kicking games. We have so much fun.

Sometimes when I kick the ball it hurts my foot.

I can't kick that well yet, but I'll get better.

I love hurdling, 'cuz I feel like I'm flying.

Gymnastics

Let's discuss the videotape replay of one of our gymnastics classes.

There I am! I'm curled up tight and rolling around in a somersault. It was hard for me at first because it seemed scary, but it was easier for others. I can do it with no trouble now. You have to be "ready" and know when to do each move. You have to be self-conscious.

I'm up there at the top of the ropes. Climbing to the top is a great stretched feeling. I know I'm strong for my age. People treat me like I'm important.

I feel excited. The balance beam is a great challenge to me. It's my one favorite. It helps me get over some things. I've been scared of heights. The high beam is pretty high, but it helps me feel better. I'm a little shaky and I wobble a lot, but I can do many different movements going back and forth.

That's me! I'm in a birds' nest. You just put your legs in the rings and squeeze your stomach out. My foot gets stuck in the ring. My ankle is killing me. My arms are tired. To be rescued is a relief.

Gymnastics is so free.

There's everything to do.

I just can't decide.

I'll be an acrobat someday.

The teacher really helps me discover how my body moves.

I like the rings.

Being upside down in a curl is good to do.

Everything is so fun.

It's fun!

Dance

When I dance, I feel . . .

Very free.
Shy.
Funny.
All of me is moving.
I never did it before.
Embarrassing.
Silly.
I feel happy and active.
I think probably everyone is watching me and laughing at me.

General

Do you have some special feelings or concerns about your experiences in games, gymnastics, or dance? Please share them.

Moving is fun. I love trying to play new things. I know a lot about running now. You shouldn't start out fast in a long, long run. You will get tired. My muscles feel tight and I feel a little stiff. I try to save my energy so I can run very fast at the end.

My concern is the ropes. They're too hard for me to climb. I tried. I go there whenever we have free time to explore. My hands get red and they feel hard and sore. I can do so many things on the rings and have lots of fun. I love the balance beam and can walk across forward and backward.

I'd like to have help doing things that I see others do, because I'm scared to do them alone.

I love hitting and running in baseball. You can really prove yourself. Girls and boys are equal. Running and leaping over the low hurdles is wonderful. I like to dance, but it's embarrassing with the boys. I'd rather do it in privacy, at home.

Gymnastics stuff is my favorite. I feel strong and pretty when I'm doing all the hanging, swinging, and rolling. I'm also good at running. I didn't know it, but I found out.

I like doing all the games. I enjoy the hula hoops, but I don't like rhythms. I don't feel like doing that stuff. It's kinda boring. Rhythm isn't part of sports and games. I don't like moving to the beat, stretching and sinking, and hopping around and all the rest. I just don't like it. I'd rather play games and learn stuff on different equipment.

I love running. I'd rather run freely than from one line to another. It's easier to just think about my running then. I imagine that I'm the fastest kid in class. I'm happy. Who wouldn't be? It makes you feel good to be the fastest, because you don't have to catch up to anybody else. I think boys should learn to dance. I like having the chance to follow rhythm. I like to go on the fast beat, because I like to move around a lot.

Summary

One of the important tasks for children growing up is to learn to know and respect the self. Movement, the content of physical education, is the genesis of the children's growing awareness. While the responses of the second graders included in this study were necessarily limited by their movement understanding, they came to acknowledge their progress in efficient movement, to appreciate the limitless possibilities of movement, and to value movement for themselves.

Enthusiastic and curious, children investigated the phenomenal possibilities of moving in their world. They grew increasingly independent and responsible. The myriad affective responses of these second graders suggest that, through the self-discovery integral to movement experience, their world acquired greater personal meaning and significance.

The affective mode powerfully influences learning experiences. This study created a climate that encouraged children's feelings of self-importance, trust, and sensitivity to anger, fear, and sadness as well as happiness, excitement, and pride. To create this climate necessitated listening to each child as an observer, guide, partner, and friend. It meant interacting closely with each child, expanding thinking, feeding ideas, and asking questions.

In addition to encouraging feelings and respect, the learning climate provided opportunities for self-expression and problem solving and allowed time for trial and error. The children were encouraged to use their imaginations and creativity.

Perhaps listening to children has been an undervalued part of the learning process. By valuing and eliciting children's thoughts and feelings, all who care about and work with children can help them discover their competencies as significant participants in the total learning environment.

Endnotes

1. Dobson, J. *Hide or seek*. Old Tappan, N.J.: Fleming H. Revell Co., 1974.
2. Orlick, T., & Botterill, C. *Every kid can win*. Chicago: Nelson Hall, 1975.
3. Logsdon, B.J. (Ed.). *Physical education for children: A focus on the teaching process*. Philadelphia: Lea & Febiger, 1977.

Physical Education, Self-concept, and Achievement

Robert Pangrazi

Self-concept is a system of ideas, attitudes, values, and commitments that constitute a person's inner world. This article examines the impact of self-concept on student achievement. The role of the teacher in developing positive self-concepts will be examined, and physical education will be shown to be an effective medium to enhance personal development.

Self-concept is learned. Youngsters learn who they are from the ways in which they have been treated by others. Combs states, "People discover their self-concepts from the kinds of experiences they have had with life—not from telling but from experience. People develop feelings that they are liked, wanted, acceptable, and able from having been liked, wanted, accepted and from having been successful."[1] Physical education experiences can offer a variety of situations for learning a positive or negative self-concept.

Ingredients for "Feeling Good"

Certain components are necessary if students are going to leave school with positive feelings. Most experts dealing with positive self-concept development[2] agree that a feeling of belonging, personal competence, and a sense of worth are an important part of development.

Belonging. Children of all ages have a desire to belong. They want to form clubs and teams and belong to the in-group. Belonging means that an individual is part of a group and is valued and accepted by others. Students enjoy being needed and wanted by others. Physical education offers this opportunity through the many team and group activities. Participants soon learn that it would be impossible to compete if others didn't cooperate. There would be no games to enjoy if others chose not to play. By the nature of the discipline, teamwork and group cohesiveness are encouraged and necessary for individual enjoyment and satisfaction.

Self-worth. People need to see themselves as being worthwhile to others because of their personal qualities. When important others such as teachers and friends reach out to them, children learn they are meaningful and important. Physical education experiences offer opportunities for participants to feel they are important to others. Many situations offer overt examples of behavior which say to the youngster, "You are important to us and your contributions are worthwhile."

Competence. Physical educators need to assure students leave the educational system with a high level of competence. While it is difficult to argue the importance of a positive attitude toward activity and fitness, it is hard to justify youngsters leaving school with little, if any, competence in activity.

Hebron states that youngsters make up to 70% of their decisions by the age of eight to participate in activity based on their level of competence.[3] If they feel incompetent and uncomfortable in an activity, they will avoid practicing it. Thus, even though a feeling of worth and belonging is necessary for positive emotional development, skill development for competence must be emphasized.

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To develop competency in a wide variety of skills, physical education specialists teaching a broad based physical education program are a necessity. Too often, physical skill development is left to chance learning during recess and sandlot games. Practice, in this context without professional feedback, may reinforce improper motor patterns which become difficult to correct as the student matures.

Feeling Good Enough to Succeed

How students view their level of competency has a strong impact on their ability to succeed. The cycle of success (or failure) is based on a positive or negative self-concept. To illustrate, a youngster arrives at school feeling positive about the ability to perform in gymnastic activities. This feeling has probably been developed through many positive practice sessions observed by important others (parents and friends). Observe the number of positive (or negative) reinforcements that can occur in a physical education class when an instructor asks students to perform.

- Fellow students comment on how skilled the student is.
- The instructor offers positive comments about the performance.
- The student receives a high grade reflecting skill level.
- The student shows the documentation (grade) for skilled performance to peers and receives positive feedback.
- The student brings the grade home and parents proudly extend congratulations.

This flood of positive feedback stimulates the gifted youngster to increase the amount of practice and energy devoted to the skill. The cycle also can be a negative one which causes youngsters to question their ability level and avoid practicing the skill. As other youngsters improve, this student does not, causing the level of competence to appear to decrease in relation to others who choose to practice. Usually, only the physical education instructor has the means and capability to intercede and help the youngster develop positive feelings toward the activity.

Enhancing Self-concept Through Physical Education

Physical education offers a setting for helping youngsters develop a positive self-concept. A positive feeling about oneself is a priceless commodity and opens up many avenues for personal growth. The ability to offer settings that stimulate achievement, enhance personal fitness, allow risks to be taken, and teach youngsters to accept responsibility for their actions make the gymnasium an effective medium for developing successful lifestyles.

Achievement. In no other discipline is success and failure as open to immediate observation by the individual and others. It is obvious when a youngster achieves in physical education classes, and the performance offers immediate feedback to the learner. A strong relationship has been established between self-concept and achievement.[4] The relationship appears, in part, to be based on low ability. However, a more serious problem arises, that of the self-fulfilling prophecy. People with low self-concepts expect to fail or do poorly. For example, when only ability measures are considered, individuals with low self-concepts do less well than would be expected based on their ability level. The low performance reinforces the poor self-concept and the cycle continues.

It is important that physical education experiences be arranged to increase the probability of success for participants. Self-concept changes occur slowly and teachers must keep their level of expectations at a reasonable level for a long period of time if change is expected. Successful experiences can be arranged and made visible to others who are important to the student.

Fitness and Appearance. Evidence shows that youngsters who possess handicaps not well accepted by society have lower self-concepts than "normal" children.[5] Physical appearance, regardless of ability level, may negatively influence a person's self-concept. When looking at body somatotypes, the muscular body receives the highest rating from students and the obese body the lowest.[6] Unfortunately, students identify obese students with more than physical attributes. They label them with negative personal qualities such as "stupid, dirty, mean and smelly."

The only area in the total school curriculum devoted to physical fitness and appearance is physical education. If the youngster does not receive aid in dealing with obesity before entering high school, odds are that an obese adult will be the result. Not only is help needed to deal with the physical problem, but teachers will have to help students maintain a positive self-image because of derogatory comments from peers and adults.

Risk Taking and Anxiety. When students with low self-concept are asked to perform, their anxiety level is raised to a level that is detrimental to performance. Students with a high anxiety level are unwilling to take risks. This lack of risk taking prevents learning from occurring. Physical education teachers can arrange learning experiences that allow students to work individually and find success. Through successful experiences, the willingness to try new activities grows and the fear of failure is decreased.

Personal Responsibility. Teachers desire that students learn to accept responsibility for their successes and failures. There appears to be a difference in the manner in which boys and girls deal with success and failure. Boys tend to blame others for their failures while girls tend to place responsibility for success on themselves.[7] This suggests that boys maintain a positive self-concept by denying responsibility for failures, and girls do it by taking responsibility for success.

Teachers need to understand that boys and girls deal with situations in different fashion. It may be possible that people find it necessary to deny responsibility for failure as a way of maintaining positive self-esteem. Placing blame and trying to determine responsibility for failure may be an unproductive procedure.

Physical educators have the opportunity to develop healthy self-concepts. Students are usually vulnerable to the influence of the physical education teacher which may, in part, be due to the appearance, fitness, and skill level of the individual. Research shows that self-concepts of elementary school children are directly related to the self-concept of the instructor.[8]

Helping Students Attain a Positive Self-concept

The following are suggestions that might help students develop a positive orientation toward themselves. Many factors are responsible for the development of high self-esteem. However, some of the following ideas may stimulate positive growth and development.

1. Help students evaluate abilities realistically. Students with low self-concepts place high demands on themselves which are nearly impossible to reach. When helping students evaluate themselves, emphasis should be placed on comparison with past performances. Physical activity lends itself to measuring performance and setting goals for improvement. Increments of achievement can be rewarded.
2. Establish an atmosphere that allows students to practice individually and progress accordingly. All students should be expected to practice activities, but should not have to perform them in front of others until they are ready.
3. Group participation is important for a youngster who feels unwanted. Arrange activities so the student can contribute to the success of the group. Place them in undemanding roles until confidence is developed.

Skipping Gym

Richard L. Sartore

The teacher asked—
Why skip gym?
Responded the student,
With a nervous grin

My shorts are dirty,
My shirt's all worn,
My feet hurt,
And my sneaks are torn.

The other day
I planned to come,
But then it happened—
Both hands went numb.

When playing games,
I feel low.
Always picked last—
What a blow!

Kids laugh,
Especially when I run,
Being called FAT BOY,
Is surely no fun.

Tell me, teacher,
Now that you know,
If you were me,
Would you go?

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4. Place an emphasis on physical fitness. It is difficult for all youngsters to succeed in activities that demand a high skill level due to varying levels of endowment. However, all youngsters can improve their personal level of fitness and benefit from increased physical attractiveness.

5. Present skills in a meaningful progression that allows small increments of learning to occur. When students make first contact with an activity, it is important that they experience success and a feeling of competency.

6. Teach students how to praise themselves and others. It appears that when students praise others, they increase their rate of self-praise.[9] When students are allowed to help each other learn, they can practice and feel comfortable stroking others.

7. Expect students to succeed. In a study by Martinek and Johnson, students who were expected to be low achievers received less teacher praise, encouragement, and acceptance than expected high achievers.[10] It is a difficult task to remain open-minded about student performance, yet necessary to assure equal opportunity for personal development.

In conclusion, physical education can have a strong impact on the development of self-concepts. The student who is positively oriented and has a sense of belonging, worth, and competence possesses a strong foundation for learning. Physical education is a unique medium for establishing this foundation that enhances learning in other curriculum areas. Skills and knowledge are learned and often forgotten. But, knowing how to learn and having a positive orientation to learning will last a lifetime.

Endnotes

1. Combs, A.W. *The professional education of teachers.* Boston: Allyn and Bacon, 1965.

2. Felker, D.W. *Helping children to like themselves.* Minneapolis: Burgess Publishing Company, 1974.

3. Hebron, M.E. *Motivated learning.* London: Methuen & Co., Ltd., 1966.

4. Purkey, W.W. *Self-concept and school achievement.* Englewood Cliffs, NJ: Prentice-Hall, 1970.

5. Richardson, S.A., & Emerson, P. *Race and physical handicap in children's preference for other children.* Human Relations, 1970, 23, 31-36.

6. Caskey, S.R., & Felker, D.W. Social stereotyping of female body image by elementary school age girls. *Research Quarterly,* 1971, 42, 251-255.

7. Felker, D.W., & Thomas, S.B. Self-initiated verbal reinforcement and positive self-concept. *Child Development,* 1971, 42, 1285-1287.

8. Edeburn, C.F., & Landry, R.G. Self-concept and student self-concept in grades three, four, and five. *Journal of Educational Research,* 1976, 69, 372-375.

9. Coons, W.H., & McEachern, D.L. Verbal conditioning, acceptance of self and acceptance of others. *Psychological Reports,* 1967, 20, 715-722.

10. Martinek, T.J., & Johnson, S.B. Teacher expectations: Effects on dyadic interactions and self-concept in elementary age children. *Research Quarterly,* 1979, 50, 60-70.

COMPETITION
A Developmental Process

Julian U. Stein

Rivalry and competition stimulate a youth's ambition.

Two opposing views

Many individuals—physical educators, parents, coaches—enthusiastically support competitive activities for children from the very youngest ages. Among the reasons they give for this strong position is that of preparing children for life in a highly competitive society.

On the other hand, another equally verbal group takes the position that competition is bad. These individuals condemn competition of any type, especially for students below secondary school age. Among the reasons advocated for this strong position is the need for children to be successful in whatever they do so as to build more positive self-concepts, with cooperation, not competition, being the key to personal development.

Two diametrically opposing positions! Which is right? Which is wrong? Or, are individuals in these two opposing camps failing to see the forest because of the trees?

Competition—Neither good nor bad

Competition in and of itself is *neither good nor bad.* Leadership and types of competition determine whether competitive activities provide positive or negative experiences for participants, regardless of their ages or developmental levels.

Competition is multidimensional, *not* unilateral and limited to games between highly organized teams or hotly disputed contests between individuals. The problem is not competition for children and youth, but *overemphasis on* and *inappropriate* competition for children and youth.

Children who are developmentally in individual or parallel play stages and thrust into highly competitive team or individual activities are truly at risk. These risks can be physical, psychological, emotional, and/or social. However, when a child's developmental level and the type of competition are compatible, participation in such activities is developmentally appropriate.

Competition—A developmental process

Competition is a developmental process and progresses through definite stages just as play and motor development progress through identifiable stages. As a child progresses through sequential motor development stages, types and levels of competition consistent with each stage should be introduced and emphasized (see Figure 1). All of the following factors—developmental stage, types of activities, instructional methods and approaches, and levels of competition—need to be consistent and compatible with each other, and determined by *each* child's developmental level.

Traditionally, motor development has been consistent with three generic stages of play: individual, parallel, and group. These stages of play are reflected and seen in activities included in good preschool motor development and elementary school physical education programs. Definite progressions and sequences neces-

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sary within and between grades provide curriculum continuums in these programs. Children are the beneficiaries when they are successfully involved in appropriate activities presented in ways which interest and challenge them.

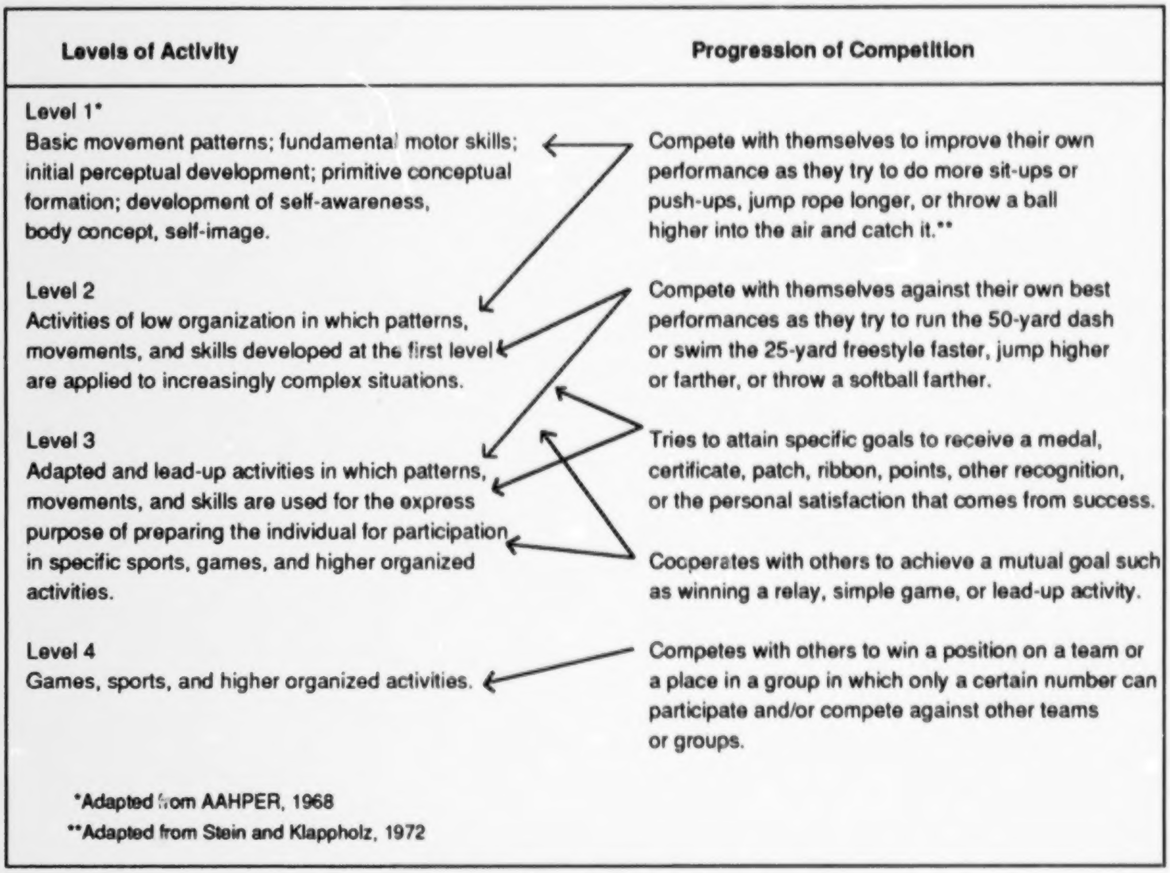
Individual activities. Initially children participate in individual activities emphasizing development of various fundamental physical and motor skills and movement patterns such as running, jumping, hopping, sliding, galloping, skipping, leaping, pulling, pushing, balancing, throwing, catching, and kicking. In this stage children have opportunities for initial perceptual development, primitive conceptual formation, and development of positive self-awareness, body concept, and self-image.

Paralleling development of these fundamental physical and motor skills is development of foundation levels of competition. Basically at this level the child competes against self to accomplish a specific task although it may or may not be verbalized and/or perceived in this way. Representative of such competitive tasks are successfully climbing to the top of the playground jungle gym, running from here to there, and swimming a full length of the pool with no help.

A child striving to do a task better than ever before represents another stage or phase of competition during the individual play stage. Representative of tasks at this stage include performing more sit-ups or push-ups, jumping rope longer, or throwing a ball higher into the air and catching it.

Transition to parallel play. The next stage of development provides transition from individual to parallel play. Skills and patterns previously learned are now applied to increasingly complex situations. In terms of activities and curriculum this stage encompasses what has been traditionally called "activities of low organization."

During this stage competition continues in the same patterns as during the previous stage. Just as activities progress and become more complex, so does competition. Children now strive to obtain more specific and definitive goals such as receiving a medal, certificate, patch, ribbon, points, other recognition, or the personal satisfaction that comes from success.



Levels of Activity

Level 1*
Basic movement patterns; fundamental motor skills; initial perceptual development; primitive conceptual formation; development of self-awareness, body concept, self-image.

Level 2
Activities of low organization in which patterns, movements, and skills developed at the first level are applied to increasingly complex situations.

Level 3
Adapted and lead-up activities in which patterns, movements, and skills are used for the express purpose of preparing the individual for participation in specific sports, games, and higher organized activities.

Level 4
Games, sports, and higher organized activities.

Progression of Competition

Compete with themselves to improve their own performance as they try to do more sit-ups or push-ups, jump rope longer, or throw a ball higher into the air and catch it.**

Compete with themselves against their own best performances as they try to run the 50-yard dash or swim the 25-yard freestyle faster, jump higher or farther, or throw a softball farther.

Tries to attain specific goals to receive a medal, certificate, patch, ribbon, points, other recognition, or the personal satisfaction that comes from success.

Cooperates with others to achieve a mutual goal such as winning a relay, simple game, or lead-up activity.

Competes with others to win a position on a team or a place in a group in which only a certain number can participate and/or compete against other teams or groups.

*Adapted from AAHPER, 1968
**Adapted from Stein and Klappholz, 1972

Figure 1. Stages of Play: Individual, Parallel, and Group.

In addition, the individual cooperates with others to achieve a mutual goal such as a crow catching a crane, skinning the snake, building a pyramid, or winning a simple relay. New Games, trust and adventure activities, and low ropes courses are excellent activities for children at this stage of development. These contribute to important achievements for optimum development of children.

Lead-up activities. As the child progresses to the next stage, patterns, movements, and skills are used for the express purpose of preparing for participation in specific sports, games, and higher organized activities. Traditionally these have been called "adapted and lead-up activities."

In this transition stage from parallel to group play, the individual's role as a contributing member of a group or team is introduced. Again, New Games, trust and adventure activities, and ropes courses offer opportunities to experience both cooperation and competition at this developmental level. Greater attention is given to exploring a variety of different activities and developing skills that can be used in a variety of sport and game activities, including those of a more competitive nature.

Competition in group and team activities. Types of competition and competitive activities continue to follow the same patterns introduced in previous stages. Major differences are in the child's attitudes toward and perceptions of competition. An individual competes with others to win a position on a team or a place in a group in which only a certain number can participate and/or compete against other teams or groups.

Obviously there are degrees and great differences in types of activities and associated levels of competition at this stage. This range includes relays and various lead-up games found in regular physical education classes, opportunities through intramural and extramural programs, and highly organized interscholastic activities.

Several observations are evident from this discussion:

- Few physical education, recreation, and sport programs consider developmental aspects of competition in general, and their relationships to developmental characteristics of children, curriculum, and activities in particular.
- Children from extremely young ages are thrust into highly competitive programs whether or not the programs are appropriate for the child—mentally, emotionally, and socially as well as physically.
- Although this discussion has presented both stages of play and associated developmental stages and levels of competition as discrete, these are oversimplifications. In real life seldom, if ever, does one stage or level neatly end and the next begin. Much overlap exists so the task of integrating play and competition becomes more complicated.

Teaching skills cannot be left to chance. Teaching about competition cannot be left to chance. Direct and indirect approaches must both be used in ongoing processes involved in teaching about competition. Teachers, coaches, and leaders must take advantage of all ***teachable moments*** to reinforce positive acts related to competitive situations, regardless of situation or ages of program participants. Likewise, negative acts must also be brought to the attention of students emphasizing *why* such acts are considered negative.

Appropriate reasons for these positions—positive and negative—must be presented and discussed fully. Children are never too young to understand differences between good and bad and appropriate and inappropriate behavior and activity.

Attention to and emphasis on competition are too important to be left to chance and teachable moments. Teaching about competition must be planned and structured in the same ways as any concepts or skills. In addition to integrating concepts of competition when teaching physical and motor skills, teachers, coaches, and leaders should consider other approaches in treating competition:

- Deal with situations as they occur in the gymnasium, on the playfield, in the swimming pool.
- Structure situations—good and bad—in activities so students have to deal with them firsthand. Be sure to follow up with appropriate discussions and possibly debates.
- Include simulations and role-playing opportunities for students through physical education as well as in conjunction with classroom teachers.

Factual information about competition represents only one part of understanding related concepts. Throughout this ongoing learning process attention must be given to the attitudes the students have toward competition. The same approaches and techniques already discussed can be used for fostering positive attitudes toward competition.

Neither information about nor attitudes toward competition can be left to chance or taught in isolation from related physical and motor skills. Greatest successes come from programs and activities that integrate and coordinate concepts and skills from both areas.

Competition, like play, progresses through definite and identifiable stages in which a youngster strives to attain an important goal.

As professional teachers, leaders, and coaches we have a great responsibility to the students, program participants, and athletes we serve. Each of us must:

- Reassess our own philosophies and practices to determine how we are (or are not) providing programs, activities, and methods which are developmentally appropriate with consistent levels of competition.
- Take positive steps to educate students, school administrators, parents, classroom teachers, youth sport administrators and coaches, the media, and the public, of relationships between appropriate developmental activities and levels of competition, positive contributions of appropriate activities with compatible levels of competition, and potential dangers of inappropriate activities and incompatible levels of competition.
- Become the strongest and most vocal advocate for *children* so inappropriate activities and overemphasis on competition will become practices of the past, and appropriate developmental activities with consistent levels of competition become the hope of the future.
- Present these positions to colleagues at local, state, district, and national meetings, conferences, and conventions, and through journal and newsletter articles so as to call their attention to these issues, stimulate their thought and analysis of these situations, and obtain their support in fostering these relationships in their programs and professional activities.

Stakes are high—children and their futures rest in the balance. Let's keep the child in childhood!

References

American Association for Health, Physical Education, and Recreation. (1968). *Physical activities for the mentally retarded: Ideas for instruction*. Project on Recreation and Fitness for the Mentally Retarded and Lifetime Sports Education Project. Washington, DC: Author.

Stein, J.U., & Klappholz, A. (1972). *Special Olympics instructional manual: From beginners to champions*. Washington, DC: American Association for Health, Physical Education, and Recreation and The Joseph P. Kennedy, Jr. Foundation.

Physical Fitness in Preschool and Elementary School-aged Children

Vern Seefeldt

The interrelationship of diet, exercise, and cardiovascular health has been documented in our scientific literature for decades. Steinhaus's 1933 classic, *Chronic Effects of Exercise*,[1] is ample testimony that the health-related benefits of proper nutrition and activity have been known for some time. Ironically, it was the association between malnutrition, inactivity, and coronary heart disease—combined with the exorbitant costs of primary health care and subsequent rehabilitation—that focused attention of government leaders, doctors, and educators on the need to prevent debilitating lifestyles. Despite the historic reluctance and delayed involvement by government, industry, and education to promote healthier lifestyles for their clients, there are indications that the environment for changing the daily living patterns of people, from infants to older adults, has never been better. The apparent readiness of many Americans to accept a greater responsibility for their personal health places a monumental challenge before advocates of physical activity programs. The educational implications of changing traditional patterns of nutrition and activity suggest that a logical place for many of the changes to be initiated is the public schools.

Some educators in early childhood and elementary school programs will probably react to the call for change in their present programs with consternation and resistance. Programs in early childhood, especially, have been governed by a prevailing philosophy that children should have ample opportunities to create and explore in a supportive environment, often in the absence of any specific, measurable objectives that relate to diet, motor skills, or physical fitness. This philosophy, which often borders on carefree indulgence, is likely to be at odds with the greater discipline demanded by a curriculum that advocates substituting vigorous activity for sedentary play, or the learning and assessment of specific gross motor skills in lieu of general emphasis on social development.

Epidemiological evidence has suggested that the risk factors associated with coronary heart disease are more closely allied with the environment than with the aging process.[2-5] Recently, such factors as hypertension, elevated blood lipids, obesity, and physical inac-

According to Seefeldt, the time was never more ripe to initiate changes in preschool and elementary schools. Change could enhance children's physical fitness during their early years and lay the groundwork for understanding and achieving physical fitness in adulthood. Seefeldt discusses the needs of children for physical fitness and the importance of children mastering motor skills and locomotor patterns essential to it. He offers four steps toward a new direction.

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tivity have been identified in young children.[6-13] Conversely, one of the essential ingredients in a program to reduce or reverse the effects of heart disease and strokes is physical activity.[14] Increased levels of aerobic activity have been associated with decreased fat weight, increases in high density lipoprotein, decreases in triglycerides, increased maximum oxygen consumption, decreased resting rates, and more efficient heart function during physical activity.[15,16] Clearly, the national strategy for controlling heart disease and its associated problems of obesity, hypertension, strokes, and diabetes calls for vigorous activity in the lives of persons at all ages.

The perplexing question to persons entrusted with the education of children and youth is "What role should programs in early childhood and elementary education have in changing current health habits?" The implication, as interpreted by the actions of public and private agencies, is that changes in living patterns will occur, whether or not formal education is a part of the process. Obviously, the task of promoting healthier lifestyles for all children could be most comprehensively and expeditiously accomplished through the leadership of the nation's schools. If the guidelines in *Healthy People* are an indication of governmental commitment, then schools must accept the challenge of enthusiastic involvement in the health of children or risk additional erosion of support for their physical activity programs.[17]

The challenges contained in *Promoting Health/Preventing Disease: Objectives for the Nation* provide a vote of confidence for the role of physical activity in the health status of individuals. However, achieving the objectives pertaining to school programs by 1990 implies that tremendous changes in content, time allocation, assessment, and outcomes will have to take place in the next five years. How must the directors of early childhood and elementary school activity programs respond to this direct suggestion for change? In the following sections solutions will be proposed separately for early childhood and elementary school programs.

Some philosophies of early childhood education border on carefree indulgence and are likely to be at odds with a more highly disciplined curriculum.

Physical Fitness Needs in Early Childhood

The temptation, when discussing physical fitness, is to assume that exercise prescriptions and work tolerance which apply to other populations have equal application in early childhood. Such a suggestion would be misleading for two reasons: (1) we do not know nearly as much about the interrelationship of physical fitness and overall health in young children as we do about some other populations, and (2) what we know about the cognitive, emotional, and motoric characteristics of young children tells us that they are different from other populations. Therefore, any combination of activities designed to enhance the fitness of young children must be administered with caution. This does not imply that activity program directors should condone free play; experience and research have provided some guidelines for structured program content that will result in significant behavioral changes.

The term "physical fitness" is not commonly associated with educational programs for preschool children. There are several reasons for this apparent omission: first, most preschool curricula emphasize the development of fine motor, social, and cognitive skills, to the neglect of gross motor activities and fitness. Some incidental large motor development may take place in these settings, but this is primarily as a consequence of play. Seldom do preschool children have access to a defined program of gross motor skills, wherein the progressions of patterns that lead to proficiency in our games, sports, and dances are taught in a systematic manner.

Second, the components of *physical fitness*, as they are identified in most factor analytic studies on older individuals, may be of secondary importance in early childhood.[18-21] For young children, the commonly defined fitness components of endurance, flexibility, and strength are *by-products* of learning the fundamental motor skills essential for locomotion and play.

There is little information available concerning the strength, power, or work tolerance of preschool children, as they are measured by conventional means. The disposition of young children does not permit investigators to obtain these data readily. Young children are not very cooperative when we ask them to wear masks or mouthpieces so that we can assess their oxygen use, to give an all-out performance by walking or running on a treadmill or pedaling a bicycle, or even to maintain the rhythm of a bench-stepping test.

Telemetering devices become objects of distraction rather than unobtrusive aids for monitoring heart and respiratory rates.

In addition, the motivation for an exhaustive effort is foreign to the nature of young children. They cease what they are doing when it is no longer pleasurable or becomes boring. Efforts to coerce or compel them to perform tasks against their will provide invalid data. The assessment of physical fitness in young children requires either a redefinition of the term "fitness" as it is commonly used, or unobtrusive means of obtaining the data.

Several attempts have been made to test the work capacity of young children through conventional means. Mrenza and Macek tested three, four, and five year old children by having them walk or run on a treadmill at 3, 4, and 5 km/h. Another group performed at a rate of 4 km/h and the grade was increased to 20 degrees. In the group who walked on a level grade, the highest heart rates and oxygen consumption were recorded at 5 km/h (142 BPM and 22.06 ml/kg/min). The authors concluded that these indications of limited work capacity were due to the artificial situation rather than the inability to tolerate greater work loads.[22]

Similarly, Parizkova reported maximum heart rates of 160 BPM in children three and a half years of age and lower rates in older children as the result of a bench-stepping test. The children were unable to maintain the three steps/min. cadence on a 25 or 30 cm. bench unless the investigator held them by one hand and mounted the bench with them. Parizkova noted the relatively small work load imposed by the bench-stepping task in relation to the telemetric heart rates recorded at normal play, which exceeded 200 BPM.[23]

These two recent attempts to monitor the work tolerance of young children outside of their natural environment indicate the results we can expect by subjecting them to conventional tests of work tolerance. In both situations, the motor skills, rather than the work load, were the limiting factors in the assessment.

Fundamental Motor Skills vs. Fitness in Preschool Years

A primary task of preschool children is to learn how to move efficiently. This is a monumental challenge when one considers the short time in which movement efficiency is to be accomplished. As we trace the motoric progress of children, it becomes evident that the early years of life are critical to their learning gross motor skills. Evidence has shown that the rudimentary skills which make up the components of our games and sports can be learned by children in an enriched environment before they are six years of age.[24-26] Indeed, no other period of time thereafter provides the abundant opportunities for children to practice these gross motor skills, nor are children ever again as highly motivated to do so. Although the *critical period* for learning postural and locomotor skills in human beings is, no doubt, broader than was suggested by specialists of child development during the 1920s and '30s, clearly the early childhood years are the most opportune time for perfecting the motor skills basic to all subsequent locomotion, sports skills, and aerobic activities.

If ***Healthy People*** indicates government commitment, schools must become involved in the health of children or risk erosion of support for physical activity programs.

A logical step in the process of defining how *physical fitness* is achieved through the activities of childhood is to identify the tasks of which locomotion and skilled performance are comprised, and then ensure that mastery of them is achieved. Although there are some cultural differences in skill development, many gross motor tasks are common to children everywhere. Skills that involve the projection and reception of the body are used in the work and leisure of most individuals and are commonly called fundamental motor skills because of their universality in the motor repertoire.

Skills such as walking and running retain their importance in the acquisition and maintenance of physical fitness throughout the life span, while others such as skipping and rolling have a greater contribution during childhood. Some are more useful in the context of physical fitness because performing them contributes to strength, power, and endurance, while others have limited utility except for fun and diversion. Some are more important because they are prerequisites to others. Those which lend themselves to repetitive performance, such as walking, running, swimming, and cycling, have greater utility in promoting cardiovascular fitness. But activities that enhance flexibility or promote the strength of joint structures or postural alignment may be equally important during childhood. These basic motor skills are essential for the performance of activities that lead to structural and cardiovascular fitness in later years.

Parents As Fitness Leaders

Parents and care givers have an important role in the motor education of young children. Proficiency in gross motor tasks and the concomitant activity level involved in learning them are directly related to opportunities for practice under skillful instruction. Contrary to the belief of many parents and educators, the motor skills of young children do not develop beyond the rudimentary stages in the absence of practice. Thus, the child's frequent attempts to perfect a variety of skills each day provide countless teachable moments for persons who supervise their activities. Conversely, children's activity levels can be stifled by environments in which the entire emphasis is on cognitive and social development.

The influence of various environments on children's activity levels was dramatically demonstrated in an experiment by Miller, who assigned preschool children to one of four learning situations. Group 1 was taught motor skills by movement specialists; Group 2 was taught by parents, who had previously learned each lesson from the movement specialists; Group 3 used the same facilities and equipment as Groups 1 and 2, but received no instruction. They played freely for the same amount of time each week that Groups 1 and 2 spent under instruction. Group 4 served as controls, comprised of children attending neighboring nursery schools. After a 27 week experimental period, the skill levels of the groups were retested. Groups instructed by the movement specialists and parents did not differ in skill level, but their skills were significantly advanced over those of the "free play" and control groups.[27]

Of particular interest was the manner in which the children in the "free play" group spent their time. After the novelty of exploring the equipment had subsided, they seldom engaged in vigorous activities. They spent most of their time sitting in small groups, involved in social games. Their lack of initiative in practicing the fundamental motor skills was evident by their post-test scores, which in some cases had reverted to more rudimentary stages than their pre-experimental scores. This regression in skill level was not noted in the scores of the other two experimental groups.

The experiment clearly demonstrated that movement skills do not develop, even in favorable settings, unless the counter-balancing forces of inactivity are overcome by direct action. The gratifying outcome was that parents, who had no special preparation to teach motor skills except their weekly lesson, made a significant contribution to their preschool child's motor development. Many of the parents remarked that their involvement in this experiment changed their mode of living from one of sedentary after-dinner socialization to a family experience in vigorous activity that all looked forward to each evening.

There are few reports on the long-term effects of early activity levels,[28,29] but we can surmise from a series of short-term reports that activity in childhood has the same beneficial contributions to health that it holds for older individuals.[30,31] Educators must take advantage of young children's innate desire to move by ensuring that the skills which provide the basis for fitness in later life are learned at this time.

Fitness of Elementary School Children

The erosion of physical education from public school curricula has become such a serious problem that the National Association for Sport and Physical Education initiated in 1983 a project designed to justify its inclusion as a legitimate subject in the regular curriculum. The scrutiny of programs is generally an indication that outcomes are incompatible with expectations. In physical education programs for elementary school children it is time to reexamine what we are trying to accomplish and whether our objectives are in concert with those who support public education. Frequently the list of objectives is so inclusive that even daily exposure and generous time allocations would not result in their achievement.

Objectives for Elementary School Physical Education Programs

The selection of objectives for elementary school physical education programs is a straightforward matter if educators apply criteria that address the concerns of expectations, feasibility, and outcomes. Three seem appropriate.

1. The objectives must be unique to physical activity programs.
2. The objectives must address the notion of order, sequence, and developmental level in the behaviors that are to be changed.
3. The objectives must define the changes in skills, knowledge, and attitudes that will result from participation in the program.

Without attempting to delineate the specific objectives of activity programs, there are two areas of concentration in which the content is unique to physical education. These are (a) the learning of neuromotor skills which are the basis of our games, sports, and dances, and (b) the knowledge, attitudes, and habits that will motivate children to enhance their cardiorespiratory fitness and personal health. The deliberate identification of these two general categories of objectives and the specific exclusion of others leads us to another obvious conclusion. As physical educators, we cannot continue to claim the responsibility for objectives that we cannot achieve. To do so will undermine our credibility with those who assess our program outcomes.

There is abundant and irrefutable evidence that children increase in strength, flexibility, and endurance, and in their abilities to perform more complex skills as they advance in age.[32] What has not been so clearly demonstrated is the influence of physical education programs on their increased prowess. The attribution of functional proficiency is confounded by such influences as sample selection, duration of the study, characteristics of the comparison group, and the age, gender, and socioeconomic status of the children involved in the studies. Many parents are also of the opinion that children acquire their motor skills and physical fitness in out-of-school agency-sponsored sports programs.[33]

In contrast to the longitudinal implications for programs that purport to influence positively the gross neuromuscular skills of children, most of the reports have been from programs that were cross-sectional in design or inferred longitudinal results from a series of cross-sectional studies. The secular trend that has contributed to greater physical size and earlier biological maturity undoubtedly also affects capacities for motor learning and function.

For a detailed discussion of the variables involved in systematic gains of motor proficiency, see Shephard's[34] discussion of this topic. Malina[35] has provided a thorough review of secular trends in movement performance, and Rarick[19] has discussed the concept of stability and change in motor skills over time.

Despite the difficulties mentioned earlier with research designs, there is unmistakable evidence that the application of good teaching-learning principles in field settings can result in significant gains in motor performance and function. Gilliam et al. demonstrated that a physical education program comprised of vigorous skills led to the increased practice of these activities during free time.[9] Kemper et al. demonstrated that five rather than three periods of physical education per week resulted in significant gains in skill for an experimental group of 12-13 year old boys.[36] Shephard et al. reported that an additional hour of supplemental physical education per day had a significant effect on the motor performance and physical condition of elementary school children. During this eight year study, the differences between the experimental and control groups became more profound over time, demonstrating the cumulative effect of the program.[37]

> To reestablish the school-based activity program —
> get the message to parents,
> give the time to children,
> give the content and process to teachers,
> and find out what works.

The criticism that school activity programs for children are not sufficiently vigorous to enhance cardiorespiratory function has some support in the scientific literature. Seliger et al. reported that minute-by-minute heart rates of 12 year old boys over a 24-hour period reached moderate intensities only 3% of the time.[38] Saris reported that kindergarten children's heart rates exceeded 176 beats per minute only 15 minutes per day for the most active group and four minutes per day for the inactive group.[39] Gilliam et al. reported that the voluntary activity patterns of 6 and 7 year old children seldom reached acceptable levels of intensity, with girls already more sedentary than boys at these early ages.[9] The marked changes that are possible, however, in lifestyles where activity and nutritional habits are designated for change, lend some credence to the suggestion that instructional activity programs for children can positively influence their health.

New Direction for Physical Activity Programs

Changing children's activity patterns requires a four-step process. *First, we must communicate to parents and administrators what we currently know about the benefits inherent in well-conceived activity programs.* This suggestion seems paradoxical because a program that claims among its outcomes a more functional cardiorespiratory system, reduced risk of cardiovascular disease, maintenance of desirable body weight, and competence in a variety of motor skills should not be in danger of erosion or elimination from school curricula.

However, these benefits have often been elusive to children and perhaps to their parents, also. Identification of model programs in which the stated objectives of skill learning and physical fitness are being met would also be an effective way to communicate our contributions to parents and administrators.

The second step in realizing the contributions of activity programs is to ensure that children have ample opportunity to participate in them. Unobtained objectives may be the result of too little time spent in a challenging environment, rather than an adequate amount of time spent in an unchallenging environment. Activity periods that provide so little time that they are merely a diversion from classroom lessons cannot be expected to yield significant outcomes.

Third, the teachers or supervisors of activity programs must become immersed in their attempts to change present levels of motor behavior and fitness. Application of the teaching-learning models proposed by Gallagher[40] and Hoffman,[41] which incorporate (1) assessment of entry behaviors, (2) appropriate content, by developmental level, (3) assessment of performance, and (4) correction of errors, would contribute greatly to attaining stated objectives.

The fourth step in reestablishing school-based physical activity programs as an essential part of children's lifestyles is to determine which procedures and activities produce the expected outcomes. Our search for credibility and acceptance has caused us to sample a variety of programs and teaching styles. Now physical education teachers have been challenged to place their recent past in perspective by selecting objectives that are unique to activity programs and then ensuring that children of all ability levels benefit from these offerings.

Endnotes

1. Steinhaus, A. Chronic effects of exercise. *Physiological Reviews*, 1933, 13: 103.
2. Eggen, D.A. & Solberg, L.A. Variation of atherosclerosis with age. *Lab. Invest.*, 1968, 18: 571-579.
3. Goldrick, R.B., Sennett, P.F., & Whyte, H.M. An assessment of coronary heart disease and coronary risk factors in a New Guinea Highland population. In R.J. Jones (Ed.), *Atherosclerosis*. Proceedings of the Second International Symposium. NY: Spring-Verlag, 1970, pp. 366-368.
4. Marmot, M.G. Epidemiological basis for the prevention of coronary heart disease. *WHO*, 1979, 57: 331-347.
5. Oliver, W.J., Cohen, E.L., & Neel, J.V. Blood pressure, sodium intake, and sodium related hormones in the Yanomamo Indian, a "no-salt" culture. *Circulation*, 1975, 52: 146-151.
6. deGroot, I., Morrison, J.A., Kelly, K.A., Rauh, J.L., Mellies, M.J., Edwards, B.K., & Glueck, C.J. Lipids in school children 6 to 17 years of age: Upper normal limits. *Pediatrics*, 1977, 60: 437-443.
7. Gilliam, T., Katch, V., Thorland, W., & Weltman, A. Prevalence of coronary heart disease risk factors in active children, 7 to 12 years of age. *Medicine and Science in Sports*, 1977, 9: 21-25.
8. Gilliam, T.B., Thorland, W.G., & Sady, S. Blood lipids and fatness in children age 7-12. *Canad. J. Appl. Sp. Sci.*, 1978, 3: 65-69.
9. Gilliam, T.B., Freedson, P.A., MacConnie, S.E., Geenen, D.L., & Pels, A.E. Comparison of blood lipids, lipoproteins, anthropometric measures, and resting and exercise cardiovascular responses in children 6-7 years old. *Prev. Med.*, 1981, 1.0: 754-764.
10. Lauer, R.M., Connor, W.E., & Leaverton, P.E. Coronary heart disease risk factors in school children. The Muscatine Study. *J. Pediatr.*, 1975, 86: 697-706.
11. Morrison, J.A., deGroot, I., & Edwards, B.K. Plasma cholesterol and triglyceride levels in 6775 school children, age 6 to 17 years. *Metabol.*, 1979, 62: 990-995.
12. Voors, A.W., Radhakrishnamurthy, B., Srinivasan, S.R., Webber, L.S., & Berenson, G.S. Plasma glucose level related to blood pressure in 272 children, ages 7-15 years, sampled from a total biracial population. *Am. J. Epidemiol.*, 1981, 113: 347-356.
13. Wilmore, J.H., & McNamara, J.J. Prevalence of coronary disease risk factors in boys, 8 to 12 years of age. *J. Pediatr.*, 1974, 84: 527-533.
14. *Prevention '80*. Department of Health and Human Services, Public Health Service, Office of Disease Prevention and Health Promotion, DHHS(PHS) Publication No. 81-50157, 1981.
15. Moffat, R., & Gilliam, T. Serum lipids and lipoproteins as affected by exercise: A review. *Artery*, 1979, 6: 1-19.
16. Pollock, M. L. The quantification of endurance training programs. In J.H. Wilmore (Ed.), *Exercise and Sport Science Reviews*, Vol 1. NY: Academic Press, 1973, pp. 155-158.
17. *Healthy People. The Surgeon General's report on health promotion and disease prevention.* U.S. Department of Health, Education and Welfare, Public Health Service, Office of the Assistant Secretary for Health and Surgeon General, DHEW(PHS) Publication No. 79-55071, 1979.
18. Bergel, R. Motor performance and physical growth components of Head Start and non-Head Start preschool children. *Symposium Papers* 1: 53-56, 1978. AAHPER Research Consortium, American Alliance for Health, Physical Education and Recreation, Washington, D.C.
19. Rarick, G., and Dobbins, A. Basic components in the motor performances of children six to nine years of age. *Medicine and Science in Sports*, 1975, 17: 105-110.
20. Seefeldt, V., Reuschlein, P., & Peterson, K. Factor analysis of motor performance for kindergarten, first and second grade children: A tentative solution. Paper presented at the Annual Convention of the American Association for Health, Physical Education and Recreation, Anaheim, CA, March 31, 1974.
21. Whitener, S., & James, K. The relationship among motor tasks for preschool children. *J. Motor Behavior*, 1973, 5: 231-239.
22. Mrenza, B., & Macek, M. Use of treadmill and working capacity assessment in preschool chidren. *Pediatric Work Physiology*, 1978, 11: 29-31.

23. Parizkova, J. Longitudinal study of somatic and functional development of preschool children. *Bibthca. Nutr. Dieta.*, 1978, 27: 65-765.

24. Bayley, N. The development of motor abilities during the first three years: A study of sixty-one infants tested repeatedly. *Monographs of the Society for Research in Child Development* 1935, l: 1-26.

25. Gutteridge, M. A study of motor achievements of young children. *Archives of Psychology*, 1939, No. 244.

26. Jenkins, L. A *comparative study of motor achievements of children five, six and seven years of age*. NY: Teachers College, Columbia University, 1930.

27. Miller, S. The facilitation of fundamental motor skill learning in young children. Unpublished doctoral dissertation, Michigan State University, East Lansing, 1978.

28. Astrand, P.O., Engstrom, I., Eriksson, B., et al. Girl swimmers. With special reference to respiratory and circulatory adaptation and gynaecological and psychiatric aspects. *Acta Paediatrica Scandinavica*, 1963, 147 (Suppl.) 1-75.

29. Eriksson, B.O, Engstrom, I., Karlberg, P., et al. The physiological analysis of former girl swimmers. *Acta Paediatrica Scandinavica*, 1971, 217 (Suppl.), 68-72.

30. Anderson, S., & Godfrey, S. Cardiorespiratory response to treadmill exercises in normal children. *Clinical Science*, 1971, 40: 433-442.

31. Vaccaro, P., & Clarke, D. Cardiorespiratory alterations in 9 to 11 year old children following a season of competitive swimming. *Medicine and Science in Sports*, 1978, 10: 204-207.

32. Branta, C., Haubenstricker, J., & Seefeldt, V. Age changes in motor skills during childhood and adolescence. Chapter 13, pp. 467-520, in R. Terjung (Ed.), *Exercise and Sport Science Reviews*, 1984, Vol. 12.

33. State of Michigan. *Joint Legislative Study of Youth Sports, Phase II*, 1977.

34. Shephard, R. *Physical activity and growth*. Year Book Medical Publishers, Chicago, 1982.

35. Malina, R. Secular changes in growth maturation and physical performance. In R. Hutton (Ed.), *Exercise and Sport Science Reviews*, Vol. 6, Philadelphia, PA: Franklin Institute Press, 1978.

36. Kemper, H., Verschur, R., Ras, K., Snel, J., Splinter, P., & Tavecchio, L. Investigation into the effects of two extra physical education lessons per week during one school year upon the physical development of 12 and 13 year old boys. In J. Boems & M. Hebbelinck, *Pediatric Work Physiology, Medicine and Sport*, Vol. II. New York: S. Karger, 1978, pp. 159-166.

37. Shephard, R., Lavallee, H., Jequier, J., Rajic, M., & LaBarre, R. Additional physical education in the primary school: A preliminary analysis of the Trois-Rivieres Regional Experiment. In M. Ostyn, G. Bersmen, & J. Simons (Eds.), *Kinanthropometry II, International Series on Sport Science*, Vol. 9. MD: University Park Press, 1980.

38. Seliger, V., Trefny, Z., Bartunkova, S., & Pauer, M. The habitual activity and physical fitness of twelve-year-old boys. *Acta Paediatr. Belg.*, 1974, 28: 45-49.

39. Saris, W.H.M., Binkhurst, R.A., Cramwinckel, A.B., Waesberghe, F., & Veen-Hezemans, A.M. The relationship between working performance, daily physical activity, fatness, blood lipids and nutrition in school children. In K. Berg & B.O. Eriksson (Eds.), *Children and Exercise IX*. MD: University Park Press, 1980, pp. 166-174.

40. Gallagher, J. Making sense of motor development: Interfacing research with lesson planning. In J. Thomas (Ed.), *Motor Development During Childhood and Adolescence*. Minneapolis, MN: Burgess Pub. Co., 1983.

41. Hoffman, S. Toward a pedagogical kinesiology. *Quest*, 1977, 28: 38-48.

TWO VIEWS

The Subject Matter of Children's Physical Education

Kate R. Barrett

In 1985, to commemorate the centennial of the American Alliance for Health, Physical Education, Recreation and Dance, a set of papers was written on the historical roots of children's physical education (Umstead, Swanson, & Lumpkin, 1985). These papers serve as an important reminder that this segment of our profession does have a history and that knowing it can help us understand our present status and direct us in the future.

From studying these papers it becomes apparent that a major shift in our thinking began to take place in the late 1950s and early 1960s in the way we viewed our subject matter. With the publication of *Physical Education for Today's Boys and Girls* by Gladys Andrews, Jeannette Saurborn, and Elsa Schneider in 1960 the concept of "human movement" as the subject matter of children's physical education was introduced and placed alongside the then current view of subject matter as "physical activities," a view that had its roots as far back as the early 1900s.

What these papers could not describe, however, because of their broad scope, was the fascinating, dynamic change that occurred from that moment on as our profession began to struggle with a different way to conceptualize children's physical education. The time period during which the greatest change occurred was between the late '50s and early '80s. The story of this evolution, how children's physical education developed between the late '50s and early '80s, is important in understanding where we are today and where we might go tomorrow. This story is found in the elementary school physical education textbooks published from 1917 to 1986, and in how the authors of these texts described and conceptualized their subject matter.

Beginning at the End

Beginning at the end of the story will make the rest of this article easier to follow. It appears that we currently perceive our subject matter from two different perspectives: physical activities and human movement. (In much of today's literature these phrases are often used to connote *an approach* to physical education. This interpretation is not being used here as these terms are being applied to the way subject matter is viewed only—a much narrower idea.)

In the physical activity view, predetermined activities are placed under major categories with each category varying in the number of activities it contains. These activities become the learning tasks. In the human movement view, learning tasks are designed from a general, yet comprehensive analysis of movement, not from a predetermined group of activities.

What makes this idea significant is that throughout the '60s, '70s, and '80s these two perspectives were so intertwined that it appeared they had to be linked together in some way; they were not perceived as being different. What the textbook study revealed to me, however, was that these views of subject matter really were different, possessing a number of distinguishing characteristics, and that the idea of bridging them or even questioning which one was best was no longer necessary or a sensible path to follow.

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The Story

Physical activities. When the subject matter is viewed as physical activities its structure is revealed by the total pattern of all major categories and their specific activities (i.e., apparatus, stunts, tumbling; sport skills and activities; simple games and relays; fitness routines and activities; rhythmic activities). In making program decisions the stress is on a balanced and wide range of activities placed in a progression from simple to complex across grade levels. As a guide for progression, most texts using the physical activities approach suggest percentages of time for each major category of activity.

Dauer and Pangrazi's *Dynamic Physical Education for Elementary School Children* (1986) is an example of a modern text taking this perspective. Differences among the texts with this view are mainly in the number of categories identified, the labels used to identify them, and the number of actual activities suggested. This concept was first explained in relation to children's physical education by Neilson and Van Hagen in their now classic text, *Physical Education for Elementary Schools* (1929). Here is how the authors first described it:

> The activity classifications in each grade level have been arranged in sequence according to judgments of their appeal and importance to the children who will use them. In situations where all the content appearing in the grade cannot be taught the teacher should make selections from each classification rather than attempt to teach all the activities found in any one classification (Neilson & Van Hagen, 1929, p. 75).

Human movement. When the subject matter is viewed as human movement, the structure is revealed by the total pattern of components (e.g., space; relationships) and subcomponents (e.g., pathways, extensions; meeting/parting; in front/behind); in other words, how the author(s) analyze movement. There are no categories of activities such as those found in the texts having a physical activities perspective. Labels, such as games/sports, dance, gymnastics, and aquatics, are used to identify a *form of movement*, not a category of predetermined activities. Progression is achieved by arranging the material (inherent in the subcomponents) in an order of simple to complex—to be used in relation to children's developmental levels. *Children Moving: A Teacher's Guide to Developing a Successful Physical Education Program* (1987), written by George Graham and several of his colleagues, and *Physical Education for Children: A Focus on the Teaching Process* (1984), written by Bette J. Logsdon and several of her colleagues, are examples of this perspective.

Based upon my study to date, it was not until the publication of *Physical Education for Today's Boys and Girls* in 1960 (Andrews, Saurborn, & Schneider, 1960) that human movement was specifically stated as the subject matter of children's physical education. In the first chapter, "Movement as a Basis for Physical Education," this idea was made explicit and a framework for describing movement was included. To my knowledge, this was the first framework for analyzing movement to appear in a comprehensive text focused on children's physical education and to be considered applicable to all aspects of the physical education program. Similarly, it was the first text to refer to games/sports, dance, and gymnastics as forms of movement, stressing the point that these movement forms "are based upon combinations of basic movements" and "acquire uniqueness according to the influences exerted by variations in such factors" as time or speed, force, space, external objects, sounds, and goals, and other people (p. 6).

A Specific Look

Physical activities. Taking a more in-depth look at how subject matter has been structured and organized, I found within the texts supporting the activities perspective two subgroups: Group A and Group B. Figure 1 (next page) illustrates this pattern and identifies the specific authors (see endnote 1). What sets the texts in Group B apart from the texts in Group A is that they were published beginning in 1958 and all include a category of similar activities labeled "movement exploration," "movement experiences," "movement education," or "basic movement." As with the other major categories a recommended percentage of time within the total program was suggested. A problem-solving methodology was suggested to teach these activities. It was "designed ... to stimulate exploration of space ... to improve control over the quality of movement and over the part of the body that is moving ... and to encourage communication of feelings and idea" (Halsey & Porter, 1958, p. 255).

While "movement exploration" (movement experiences, movement education, or basic movement) was being presented as a new category of activities, the authors' rationale for including it differed from the rationale given for including the other categories (i.e., apparatus, stunts, tumbling; sports skills; rhythmic activities). The authors spoke of the movement exploration activities as relating to other activities across all categories. This idea was stated in the Halsey and Porter 1958 text, the first text to include such a category, and can be found in all the texts that followed (Group B texts). The idea of certain activities relating to other

Physical Activities

A		B	
Clark	(1917)	Halsey & Porter	(1958)
State of Michigan	(1919)	Dauer	(1962)
Wild & White	(1924)	Halsey & Porter	(1963)
La Salle	(1926)	Fait	(1964)
Neilson & Van Hagen	(1929a)	Dauer	(1965)
Neilson & Van Hagen	(1929b)	Anderson et al.	(1966)
La Salle	(1937)	Dauer	(1968)
Salt et al.	(1942)	Miller & Whitcomb	(1969)
LaSalle	(1946)	Corbin	(1969)
Sehon et al.	(1948)	Fait	(1971)
Wild & White	(1950)	Dauer	(1971)
Van Hagen et al.	(1951)	Vannier et al.	(1971)
Miller & Whitcomb	(1957)	Anderson et al.	(1972)
Bucher & Reade	(1958)	Arnheim & Pestolesi	(1973)
Evans et al.	(1958)	Miller et al.	(1974)
Vannier & Foster	(1963)	Dauer &Pangrazi	(1975)
Miller & Whitcomb	(1963)	Fait	(1976)
Litell	(1965)	Vannier & Gallahue	(1978)
Neilson et al.	(1966)	Arnheim & Pestolesi	(1978)
Bucher & Reade	(1970)	Dauer & Pangrazi	(1979)
Siedentop etal.	(1984, Part IV)	Bucher & Thaxton	(1979)
		Dauer & Pangrazi	(1983)
		Dauer & Pangrazi	(1986)

Human Movement

Andrews et al.	(1960)
Schurr	(1967)
Schurr	(1975)
Burton	(1977)
Logsdon et al.	(1977)
Kruger & Kruger	(1977)
Figley et al.	(1977)
Schurr	(1980)
Morris	(1980)
Graham et al.	(1980)
Hoffman et al.	(1981)
Fowler	(1981)
Kruger & Kruger	(1982)
Logsdon et al.	(1984)
Siedentop et al.	(1984, Part III)
Nicholas	(1986)
Graham et al.	(1987)

Figure 1. Classification of elementary school physical education textbook authors according to their perspective regarding subject matter (Barrett, 1986).

activities was not new, for Ruth Glassow (1932) had already suggested this in relation to the teaching of sports skills. What she had not done was relate it specifically to children's physical education. Looking back, the addition of this category of activities seems logical and timely.

Human movement. For the present all texts classified as supporting human movement as subject matter have been placed in one group although marked variations exist among them. A detailed analysis of these texts is not feasible for the variations among them are still too great. Some general points, however, can be made.

1. Authors are clear in their intent: goals are stated to emphasize the important role that movement plays in a child's life and that learning how to move and learning about movement itself is a worthy aim in and of itself. Children's physical education is focused around the ideas of moving efficiently and effectively, becoming aware of the joy of moving, and understanding principles that govern skilled movement (Burton, 1977; Logsdon et al., 1984; Morris, 1980; Nichols, 1986; Schurr, 1980).

2. Authors are clear in their belief that human movement is the basis of children's physical education. In their attempts to describe programs, however, some of them ultimately present them in a way that is similar to programs based on the activities perspective. Three interpretations are offered for this situation: (a) authors may be in a period of transition, trying to make a shift from the activities perspective to the human movement perspective with their ideas ahead of the language the profession has to explain it, (b) authors may still be in an early stage of understanding what it means to perceive human movement as the basis of children's physical education, and (c) authors may be trying to use an idea without fully understanding it.

3. Authors see a general analysis or classification of movement as an integral and initial step when designing children's physical education programs. While there is great variety among these analyses, the way movement is being analyzed appears to be influenced primarily by the work of Glassow (1932), Broer (1960), H'Doubler (1962), and Laban (1948, 1963) (see endnote 2).

From my perspective the current attempts to conceptualize human movement as the subject matter of children's physical education represent another significant event in our history. This perspective is clearly different from the perspective taken by both groups of texts classified as supporting physical activities as subject matter, and now has even achieved a 16-year history of its own. As stated earlier, what now appears to be true is that we have *two* valid ways to conceptualize the subject matter of children's physical education, each one important in its own right and capable of guiding quality program decisions, whereas up to this point we had been searching for the *right one*.

Meaning for Teachers and Teacher Educators

Prior to studying the textbooks, my perception was that our profession was confused about the subject matter of children's physical education, and that this situation revolved around what seemed to be a "continuous debate among physical educators over what should guide the direction of children's programs: should it be the *traditional* approach, or should it be the *movement-oriented* approach" (Barrett, in press). What I now think, as a direct result of examining the textbooks, is that this debate is not something we need to or should continue; it is not helpful. This new position rests with the significance I place on the existence and introduction of the movement exploration category of activities in the Halsey and Porter (1958) text (also labeled in later texts as movement experiences, movement education, or basic movement) and the Andrews, Saurborn, and Schneider (1960) statement that human movement was the basis of children's physical education. These two events and how their development can be traced in the textbook literature has certainly made me think more clearly about the issues in our field that surround the topic of subject matter and children's physical education.

While I acknowledge that these two ideas did get confused during the early part of their development (Barrett, in press; Hudgens, 1987), they are quite separate now, if my analysis is accurate. What this new understanding does is free teachers to conceptualize the subject matter of their programs around one basic orientation rather than feel they must include both or try to bridge them. What this does not eliminate, however, is the need for teachers to possess a rich understanding of movement as a knowledge base for program design no matter the perspective taken regarding subject matter. Knowledge such as mechanical concepts that affect efficiency, developmental sequences for inter- and intra-skills, and effort analysis, for example, continue to be essential information. Only through this understanding of movement, working in concert with how the subject matter is viewed, and thus understood, can quality objectives, progressive experiences, and appropriate evaluation techniques be designed for children's programs as well as teacher education programs for pre- and inservice teachers.

For example, I am already using the idea of two views of subject matter with teachers in the field and students in my undergraduate classes. As a curriculum consultant, accepting that two views of subject matter do exist gives me an immediate way to talk about the program under study on their ground, so to speak. At the start of the consultation, I ask the teacher(s) with whom I am working which text of those published they find the most helpful. If they do not use a text, I outline briefly the two views of subject matter and ask which of them most closely represents their way of thinking. Starting from this position allows me to begin consulting from their view of subject matter and not mine. This implies that as a consultant one must have advanced knowledge of both views and how each is constructed. For example, you will have to know how progression is handled from both perspectives and how this affects unit and lesson design and instructional strategies.

As a teacher educator, and prior to studying the textbooks, I always showed my preservice teachers the range of textbooks that were available as resources, but never organized my presentation from the position of two views of subject matter. As their preparation in children's physical education was designed around the human movement perspective of subject matter, messages may have been passed on that suggested the activities perspective to be inferior. This issue is now handled directly, with the position being taken that there are two views of subject matter and both are possible and both are valid. Both could result in strong programs if the theoretical base supporting them is known and used.

Distinguishing between the two views of children's physical education, the physical activities perspective and the human movement perspective, is essential in structuring a program that has philosophical integrity.

If time permitted I would spend more time on having them understand both views and how our profession got to this position historically, but that luxury is not possible so a carefully designed orientation to the situation must suffice. Observing recent alumni shift to a physical activities perspective, while thinking they were implementing a human movement perspective, has alerted me to the importance of understanding both, because the program that resulted had no direction and no sound rationale guiding it.

My interpretation of this situation is not that one view is better than the other, although I do hold a preference for one, but that having no clear view leaves you helpless to the influence of such factors as convention programs and their overwhelming diversity along with commercial companies and the lure of the latest equipment. A clear orientation to subject matter is essential since it provides a way to reevaluate/redirect programs that is not haphazard and thoughtless.

What I have discovered from my study of the American texts published between 1917 and 1987 is that children's physical education may be at a point in its development, and specifically in relation to subject matter orientation, that suggests we make a choice between two valid, yet different views. Trying to mesh them, bridge them, or debate them, rather than develop programs based on their unique qualities, may only impede the potential excellence each perspective has for influencing the future quality of children's physical education.

I have come to accept that the nature of our subject matter will always be constantly emerging, but that, as Hetherington said in 1922, it cannot all be of use as it is "of unequal value in the education of children" (p. 53). What this implies is that a major challenge to teachers is in the selection of what is of most value to teach, and that decision cannot be made if teachers do not have a clear understanding of their subject matter. Maybe the idea that we do have two views, one focused on physical activities and another on human movement, might help. I know it has freed me to think in new ways.

Endnotes

1. Copies of the complete bibliographical references for all textbooks reviewed (58) may be obtained from the author by sending her a stamped, self-addressed envelope at PE Department, UNC-Greensboro, Greensboro, NC 27412.
2. For readers interested in how different authors approach the task of analyzing movement for teaching see Barrett, 1985.

References

Andrews, G.A., Saurborn, J., & Schneider, E. (1960). *Physical education for today's boys and girls*. Boston: Allyn and Bacon.

Barrett, K.R. (1985). The content of an elementary school physical education program and its impact on teacher education. In H.A. Hoffman & J.E. Rink (Eds.), *Physical education preparation: Insights and foresights*. Reston, VA: American Alliance for Health, Physical Education, Recreation and Dance.

Barrett, K.R. (1986). Thinking about the subject matter of children's physical education. *The North Carolina Journal for Health, Physical Education, Recreation and Dance*, 22(2), 1-4.

Barrett, K.R. (in press). The subject matter of children's physical education—"No gap to bridge, no race to run." *Proceedings of the Fifth Conference on Curriculum Theory in Physical Education.*

Broer, M.R. (1960). *Efficiency of human movement*. Philadelphia: Saunders.

Burton, E.C. (1977). *The new physical education for elementary school children*. Boston: Houghton Mifflin.

Dauer, V.P., & Pangrazi, R.P. (1986). *Dynamic physical education for elementary school children* (8th ed.). Minneapolis: Burgess.

Glassow, R. (1932). *Fundamentals of physical education*. Philadelphia: Lea & Febiger.

Graham, G., Holt/Hale, S.A., & Parker, M. (1987). *Children moving: A teacher's guide to developing a successful physical education program* (2nd ed.). Palo Alto: Mayfield.

H'Doubler, M.N. (1962). *Dance: A creative art experience*. Madison: University Press.

Halsey, E., & Porter, L. (1958). *Physical education for children*. New York: Henry Holt.

Hetherington, C.W. (1922, 1926). *School program in physical education*. Yonkers-on-Hudson, NY: World Book.

Hudgens, A. (1987). Analysis of the concept of movement education in American elementary school physical education. Unpublished doctoral dissertation, University of North Carolina, Greensboro.

Laban, R. (1948). *Modern educational dance*. London: Macdonald & Evans.

Laban, R. (1963). *Modern educational dance* (rev. ed.). London: Macdonald & Evans.

Logsdon, B.J., Barrett, K.R., Ammons, M., Broer, M.R., Halverson, L.E., McGee, R., Roberton, M.A. (1984). *Physical education for children: A focus on the teaching process* (2nd ed.). Philadelphia: Lea & Febiger.

Morris, G.S.D. (1980). *Elementary physical education: Toward inclusion*. Salt Lake City: Brighton Publishing.

Neilson, H.P., & Van Hagen, W. (1929). *Manual of physical education activities for the elementary schools of the state of California*. Sacramento: California State Printing Office.

Nichols, B. (1986). *Moving and learning*. St. Louis: Times Mirror/Mosby.

Schurr, E.E. (1980). *Movement experiences for children: A humanistic approach to physical education* (3rd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Umstead, E.C., Swanson, R.A., & Lumpkin, A. (1985, April). *The history of elementary school physical education—1885-1985*. (Available from K.R. Barrett, Department of Physical Education, The University of North Carolina at Greensboro, Greensboro, NC 27412.)

Note: Access to early texts was made possible through the UNCG Jackson Library's Special Collection: The History of Physical Education and Dance for Children.

GAMES AND SPORTS
Offering Social, Competitive, and Functional Purpose

Games offer experiences which should be incorporated into the total physical education program to give students a wide range of opportunities.

Susan Capel

One of the stated aims of physical education is to help children try to reach their full potential. Games should contribute to this aim by helping children become skillful games players, while accommodating for individual differences. Games have always been an integral part of the physical education curriculum. However, traditional concepts of games have not always been to help children develop to their full potential; competition has too often become the major reason for incorporating games into the elementary curriculum.

Competition vs. Cooperation

Different forms of games can produce a variety of experiences, from highly to minimally competitive. The teacher should keep this in mind when providing games experiences for all children. When learning a skill, the amount of competition must be minimal. Cooperation among players will aid skill development. As skill level improves, the children may wish to compete against each other. This will help development as long as they are taught to compete within the rules, to plan a strategy to aid their course, to play against students of equal ability, and to exert themselves to the limit of their skill and mental power.

Games naturally develop from cooperative to competitive. Children should have the opportunity to learn the traditional games of our culture, but they should also have opportunities to make up their own games. In self-created games they will become aware of the necessity of scoring, rules, purpose of the game, and the role of a referee to facilitate play and safety. This should help them to understand and respect the meaning of sportsmanship and cooperation.

Games range from highly social interaction to individual play. Team games present two types of experiences: competitive—opposition of one team against the other, and cooperative—interaction among teammates to achieve a winning score. Single games offer a competitive experience limited to action and reaction.

Other games, like bowling and golf, are entirely individual. The action is related to equipment and/or environmental conditions. Games, therefore, offer a full range of experiences from interaction of individuals

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within groups, to action and reaction between groups or individuals, to solitary play.

Children of different age groups, if given a free choice, are likely to choose different experiences. Preschool children will probably choose individual play; elementary children are likely to show a progression of choice from individual to partner to small group play; and upper elementary age children progress from large groups to intergroup play to more organized team play. If teachers appreciate children's preferences as evidence of being ready for the experience the different games situations offer, a valuable contribution to social growth of children should result.

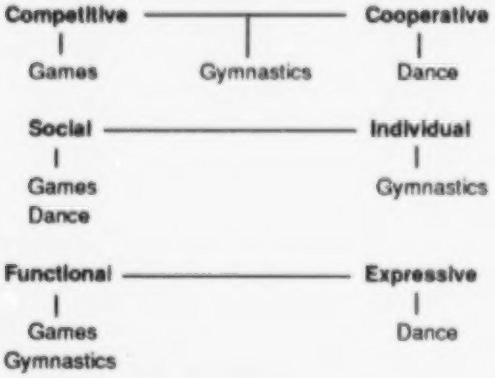
The Purpose of Games

The type of movement usually associated with games is objective movement. The primary purpose is functional, not expressive. Objective movement can be defined as a movement to accomplish a practical task (to kick a ball or vault a fence). In contrast, expressive movement conveys a thought or feeling; the body is used for communication.

Further, games situations are rarely, if ever, the same. The environment is always changing. Players must constantly adjust the movement patterns used. Development of versatile and self-directed moves is therefore important. Being versatile means being able to handle the body efficiently and effectively while constantly adapting to new situations. Games movements are not stereotyped.

Therefore, games offer experiences which should be incorporated into the total physical education program to give students a wide range of opportunities. The contribution of games, in contrast to gymnastics and dance, is seen in Figure 1.

Figure 1. The Competitive-Cooperative, Social-Individual, Functional-Expressive Continuums of Physical Education (Stanley, 1969, p. 34).



Games Skills

In the past, games teaching has concentrated on teaching skills specific to a particular sport. Each skill was learned for its use in a game, rather than for its value in meaning for the individual or in movement for its own sake. By adopting a movement education approach to teaching games, movement learning becomes a means of future learning and application, not an end in itself.

In this approach, a key goal is skill in games, and games skills are open skills. Thus teaching involves designing experiences that cause learners to keep adjusting their responses to different situations. Patterns of movement responses are developed which are varied, appropriate, and effective. Students should become adept in constantly changing situations. A skill, such as dribbling with the feet, becomes an action concept in which students develop the ability to perform the skill in a variety of unexpected situations; for example, traveling with the ball, or abruptly changing speed and direction of the ball to dodge, pass, or shoot as needed.

Games skills can have the following three different purposes:

- a direct relationship to movement demands of a specific game
- movement demands of a combination of specific games (basketball, volleyball, and softball)
- movement demands which are inherent and common in many games (dodging, changing speeds, intercepting).

Awareness Focuses

All games skills can be analyzed and developed in relation to the four awareness focuses of body, space, effort, and relationship. Table 1 shows the essential features of these awarenesses in relation to games.

Body awareness in games

Body awareness skills required in games are control of equipment and efficient management of the individual's body when not handling the equipment.

Incorporated within these two main categories of body awareness skills are:

- Shifting body weight: to move to a ball, guard an opponent, get into a space, etc.; awareness of shifting weight from one foot to the other by sliding, jumping, stepping, running, moving the feet while controlling the ball, stopping suddenly, changing speeds and/or direction suddenly

- Balance: learning the effects of size of base, position of center of gravity, transference of weight to stop suddenly without falling over, change direction, control a fall and recover quickly, balancing while in the air
- Turns: pivot in basketball, base running in softball
- Jumping and landing: take off, body in flight, control of body weight in landing
- Locomotion: mobility, side-steps, short runs, lunges, step-hops, etc.
- Use of different parts of the body: head to see, maintain balance, create speed in spins/turns; knees to bend to absorb shock on landing from a height, to spring into a jump; feet and ankles to receive weight; weight transference from one part to another to provide power or spring, lightness, resilience
- Basic functions of curl, bend, stretch, twist: curl in falling to prevent injury; stretch to outreach an opponent to the ball; twisting when faking and dodging
- Body shapes: wall-shape for guarding a person, pin-shape to penetrate through an offense without contact, ball-shape to provide some protection when impact is expected, screw-shape when twisting and dodging in a game
- Control of equipment: receiving, seizing, retaining, or letting go. The basic curl, bend, stretch, and twist actions are essential in equipment use. Examples in specific games include crouching (curling) to get under a low ball in volleyball. The crouch gives power for the subsequent stretch when the ball is volleyed. A stretch is used in basketball when jumping for a ball. Twisting is used when batting a softball. Locomotion is also used to control the ball. For example, when intercepting a basketball with one hand, it may not be possible to hold it; therefore, it is directed into a bounce and kept moving in a dribble. Ball movement may occur while the body is traveling upward in a jump, such as during a lay-up shot in basketball. Feet are used to propel, check, and control a soccer ball
- Weight bearing and weight transfer: important in control of equipment; affect power and accuracy.

Space awareness in games

Space sense is important for accuracy in placing the ball, awareness of open space, and use of space in relation to the body and equipment. Changing directions with or without the ball makes it more difficult for an opponent to anticipate play. Awareness of space is important in controlling the direction of the ball, such as passing diagonally in front of a teammate running toward the goal, or volleying the ball into back corners of a volleyball court. A sense of space is necessary in handling the direction of bodily movement, such as when controlling the direction of follow-through in throwing, hitting, or kicking to achieve the required pathway for the ball.

Table 1. Awareness Qualities in the Teaching of Games Skills

Body Awareness

A. Body Management Skills:
    Shifting weight
    Balance
    Body actions
    Body parts stressed
    Basic functions (curl, stretch, bend, twist)
    Body shapes
B. Control of Equipment:
    Basic functions (curl, stretch, bend, twist)
    Body actions
    Body parts stressed
    Weightbearing
    Body shapes

Space Awareness

Directions
Change of levels
Player and ball pathways
Patterns
Extension

Effort Qualities

Time
Weight
Space
Flow

Relationships

Relationship of the player to the playing area, and to the equipment
Relationship of the player to the rules, and to the officials
Relationship of the player to teammates, and to opponents.

Becoming aware of contrasts of large and small and near and far is important in game play. Is the serve sometimes short, at other times long? Can the goal be shot from both close range and farther out? Is the length of the pass varied?

Effort qualities in games

Effort quality is important (a ball can be bounced faster or slower, timing can be changed to outwit an opponent, pace can be changed). In addition to the timing element, a teacher needs to be aware of the weight factor. For example, a softball hit with strong quality needs a firm grip and forceful hit, whereas a bunt needs finer force. A badminton net shot needs a fine touch. Flexible use of space or direct use of space is also important. Flow also needs to be considered. There are two kinds, free flow and bound flow. Free flow occurs with, for example, an overhand throwing action, whereas all actions concerned with stopping a ball, particularly when there is "give" to reduce the impact of the ball, are bound flow. The need to either check the movement or allow the movement to carry on to its normal conclusion determines the type of flow quality required.

Relationships

Players move in relation to boundaries, equipment, partner or teammates, opponents, and rules of the game. For example, the "throw-in" in soccer, a volleyball server, softball pitchers, and batters all have lines which restrict movements and add to the difficulty of balance.

Relationship to equipment involves manipulative and nonmanipulative actions. In manipulative actions, experience and stage of skill development are important. "Getting the feel of it" is important to find out what the person can do with a ball and what part of the body can help control it. Control is then taught (start and stop a soccer dribble at will without losing control), followed by how to utilize the skill (to hit a target, keep the ball from another player, race with it). Finally, proficiency is emphasized to test and enjoy mastery of the skill in playing a game.

Nonmanipulative activities include the person's relationship to net, goal, or target. A person's relationships to others include being alone-in-a-group and being in cooperative and competitive situations.

Themes for Teaching Games

Games teaching in the elementary school can be organized into themes, which are determined by Laban's four awarenesses of body, space, effort, and relationships. These themes utilized in the games portion of the physical education curriculum have been classified by Barrett (1984) as:

introduction to basic body and manipulative control: includes locomotion (traveling and stopping, running, jumping, sliding, sidestepping), body parts (hands, feet, shins, knees, hips, head, shoulders, and chest), and manipulative activities (striking, traveling, catching, collecting, carrying, dribbling)

introduction to space: using manipulative activities of striking, throwing, catching, collecting, dribbling, and carrying to illustrate general and personal space; high, medium, and low levels; near to and far from extensions; forward, backward, sideward, upward, and downward directions; and ground, air, curved, and straight pathways.

introduction to movement quality (effort): manipulative activities of striking, throwing, catching, collecting, carrying, and dribbling are used to develop awareness of force (strong or light), speed (fast or slow), and space-quality (small or large)

movement flow: free and bound flow, and continuity of activity using manipulative skills

introduction to basic relationships: includes relationships to objects, the body, and body parts and implements basic relationships within the game environment

advanced body and manipulative control: manipulative activities are combined with locomotion and nonlocomotion (extending, thrusting, and bending)

introduction to complex relationships: incorporates relationships within the environment including passing to spaces, creating spaces, and covering spaces.

Preschool and kindergarten

The first theme introduced to this age group is basic body and manipulative control, to allow students to begin developing mastery essential for playing games. The six basic manipulative activities of striking, throwing, catching, collecting, carrying, and dribbling are central to games in which objects are manipulated. The development of these skills is essential to later advancement and refinement in specific game situations.

Lessons involving striking with the preferred hand, striking with the preferred foot, and striking underhand with implements in different directions could be activities used to develop striking skills (e.g., strike a soft, small ball with your arm, knees, and head; try to stay on one spot while striking the ball so that it goes above your head toward the ceiling).

Throwing activities may include throwing a soft (nonbouncy) ball against the wall, quickly collecting it, returning to the starting place, and throwing it again. Underhand and overhand throws in a forward direction may be other activities used to introduce throwing skills.

Catching underhand and overhand with two hands, carrying with two hands while traveling, and dribbling with the preferred hand and foot are all important skills introduced at this age level. Once introduced, these skills can be developed quickly to incorporate more complex skills (e.g., striking and keeping the ball in the air without letting it bounce between strikes).

Locomotion incorporates running, jumping, sliding, sidestepping, traveling, and stopping activities. Running forwards and sideways, and stopping and starting on signal can be good starting points to introduce locomotor skills. Further development may include rolling a ball and chasing it, or running in a curved or zig-zag pathway. Dribbling using different parts (inside, outside, top) of the foot while traveling through space can be used to introduce awareness of body parts.

Units included in this theme include traveling, stopping and starting, and carrying (4 lessons), traveling, stopping and starting, throwing and catching (12 lessons), dribbling, stopping and starting, traveling, throwing and catching (12 lessons), throwing and catching, catching followed by carrying and traveling (12 lessons), striking and trapping (12 lessons), and striking and carrying with implements (8 lessons). Emphasis on different body parts will occur within these units to fully develop this theme.

First and second grades

The first theme introduced to this age group is space awareness (emphasis on the environment). The concepts of personal and general space can be introduced by activities such as rolling a ball into space forwards, backwards, and sideways and then running to collect it. Another activity is dribbling with one hand first in a limited space and then a large space. Activities which emphasize levels are throwing a ball against a wall so that it hits the wall at different levels, catching it as it comes back from the wall, and batting at middle level.

Extensions can be taught through activities such as striking with hands and feet with the ball first close to the body then farther away from the body, and throwing so that a partner has to reach forward, upward, or sideways to catch it. Traveling and dribbling in different directions are examples of activities which may be used to develop awareness of directions. Finally, pathways could be introduced by first throwing straight to partner, then throwing in a high loop, then bouncing the ball, or running or dribbling on different pathways.

A second suitable theme for first and second graders is an introduction to movement quality (effort). Developing force production by throwing, striking, and dribbling, and developing force absorption in catching and collecting are important concepts. Throwing a ball back and forth to a partner so that he or she can catch it while gradually moving farther apart is one way to develop force.

Accelerating and decelerating speed of the moves and for the object are also important concepts in this theme. Activities can be rolling a ball back and forth to a partner at different speeds, dribbling a ball, and accelerating or decelerating when changing direction. Getting the correct depth (near/far) for a particular activity is vital, and should be stressed at this time.

Units that develop these two themes by emphasizing space and movement qualities (effort) could be as follows for first grade students: traveling, stopping and starting, catching combined with stopping and starting, and traveling while dribbling (12 lessons), dribbling, trapping, and throwing (12 lessons), catching and striking (12 lessons), traveling and catching, catching with implements (12 lessons), catching and striking with different body parts, and catching and striking with implements (12 lessons); for second grade students: traveling, creating spaces (4 lessons), catching, throwing, trapping (8 lessons), catching, throwing, striking (8 lessons), traveling, carrying, creating spaces, striking (10 lessons), catching with hands, catching with implements, striking, dribbling (8 lessons), and striking with different body parts and with implements (10 lessons).

Third and fourth grades

Children at this age should be ready to be introduced to a theme concerning movement flow, bound (hesitant, tense, restricted) and free (easy, relaxed). Further, continuity must be developed in movement. Sample activities include traveling as fast as possible in space, stopping suddenly on signal, dribbling with hands or feet, trying to accelerate and decelerate while constantly changing direction, and striking a ball in the air with different body parts keeping it going as long as possible. Again, manipulative activities would be used to teach these qualities.

A second theme suitable for this age group is introduction to basic relationships. Children need to become aware of how to relate in space. This includes relationships to objects to allow for effective movement. Activities can be running to collect a ball thrown at different speeds and from different directions by getting in the best position behind the ball, or striking a ball with different body parts under, beside, or on top of it.

Environmental relationships relate one's movement to others, movement with others and against others, and movement with objects and boundaries. Activities in this theme can be running with a partner from one end of a space to the other while throwing a ball slightly ahead of the partner, then moving through a space in groups of four or five and throwing the ball among the group in different ways, and dribbling through and around cones in different orders, directions, and speeds.

Skill focuses used to develop these two themes of movement flow and basic relationships may incorporate the following for third graders: traveling, catching, creating spaces by throwing, creating spaces by running, player's position (10 lessons), traveling, catching and trapping, creating spaces by striking with body parts, player's position (10 lessons), traveling, player's position, creating spaces by running (10 lessons), traveling, dribbling, covering spaces by marking, trapping (10 lessons), and throwing, catching, striking with body parts and implements, trapping, covering spaces by marking, creating spaces by passing and running (20 lessons).

Units with fourth grade children could incorporate more specific games skills. Basketball game skills can include throwing, catching, dribbling, creating spaces by running and passing, and covering spaces by marking. Soccer activities could include striking with body parts, trapping, dribbling, creating spaces by running and passing, and covering spaces by marking. Hockey skills can be striking with an implement, trapping, dribbling, creating spaces by running and passing, covering spaces by marking, and player's position. Football activities include throwing, catching, traveling and carrying, creating spaces by passing and running, and covering spaces by marking. Striking with an implement, catching, traveling, covering spaces by marking, and player's position should be included in softball activities. Volleyball activities include striking with body parts, creating spaces by passing, covering spaces by marking, and player's position. Not all these skills and activities will be taught in the fourth grade; there will be carry-over into the fifth and sixth grades.

Fifth and sixth grades

By using the above examples of specific games as activities, an advanced body and manipulative control theme should be introduced. Manipulative activities combined with locomotion combined with non-locomotion should be developed. Activities should include such things as throwing a hard, direct pass to a player who is running quickly into a space, or fully extending a leg to try to prevent a ball passed along the ground from getting past.

This theme should be followed by a theme to introduce complex relationships, such as passing ahead of a teammate or an opponent, passing behind a teammate, or passing even with a teammate. These four actions incorporate passing into a space, a "lead pass," and dodging. Relationships within the environment include creating spaces, making space for another player or oneself, moving or cutting back into or through, and covering spaces while positioning between the ball and the person being marked.

Summary

By incorporating skill teaching into themes focusing on the awareness qualities of body, space, effort, and relationships, the whole spectrum of skills and qualities will be developed. The age/grade levels at which these themes should be introduced may not necessarily coincide with those indicated here. The needs of the children at a particular time may determine a different length of time for each theme, or a different time at which the theme is introduced; the grade levels indicated here are merely suggestions.

The themes suggested for use in the games section of the physical education program should be compatible with themes developed within the gymnastics and dance sections. Each of these three activities should occupy roughly one-third of the allotted physical education time throughout the elementary school. If this occurs, the children will have a rich, rewarding, and varied range of experiences from which they can develop an extensive movement vocabulary.

References

Barrett, K. (1984). In B. Logsdon, K. Barrett, M. Broer, R. McGee, M. Ammons, L. Halverson, & M.A. Roberton, *Physical education for children: A focus on the teaching process*. Philadelphia, PA: Lea & Febiger.

Stanley, S. (1969). *Physical education: A movement orientation*. Montreal, Canada: McGraw-Hill Co.

Bibliography

Blake, O.W., & Volp, A.M. (1964). *Lead-up games to team sports*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Logsdon, B., Barrett, K., Broer, M., McGee, R., Ammons, M., Halverson, L., Roberton, M.A. (1984). *Physical education for children: A focus on the teaching process*. Philadelphia, PA: Lea & Febiger.

Maulden, E., & Redfern, H.B. (1970). *Games teaching: A new approach for the primary school*. London, England: MacDonald & Evans, Ltd.

Morris, G.S.D. (1980). *How to change the games children play*. Minneapolis, MN: Burgess Publishing Co.

A Dynamic Approach to Teaching Games in Elementary PE

Most sports require high skill levels for even moderate success. In Teaching for Understanding, however, the teacher modifies the sport to emphasize a fundamental game concept. Students concentrate on game strategies rather than correct skill performance.

Sarah A. Doolittle Karen T. Girard

Here is an all-too-familiar scenario: A teacher is frustrated with the problems of trying to teach sports skills to a large primary level class. The lower-skilled students are discouraged with their lack of success, and the talented ones are becoming discipline problems because they're not challenged. Even a very motivated and creative teacher can become frustrated trying to provide an effective progression of game skills to all kinds of students. Teaching for Understanding, a method which can help solve some of these problems, is presented here.

An Explanation of Teaching for Understanding

Teaching for Understanding (Bunker & Thorpe, 1982; Werner, 1989; Werner & Almond, 1990) is an approach to teaching traditional sports in which basic concepts of a game are emphasized rather than acquisition of game-related motor skills. Rather than teaching all the basic skills of a particular sport and then playing a game, teachers using the Teaching for Understanding approach teach the game and have the students practice skills by playing modified games.

Based on a classification system for games or sports, Teaching for Understanding organizes sports by their fundamental design. For example, soccer, basketball, and hocky have certain principles in common and are called *invasion* games. These are games in which a team tries to win by invading the other team's side of the field and then shooting the ball or puck into a goal. Each game requires different motor skills and rules, but the object and fundamental strategies of the games are very similar. Students who understand how to win at soccer will have a good understanding of how to win at basketball and hockey, because they understand the fundamental strategies common to invasion games.

Other sports may also be classified by their shared strategies. Volleyball, tennis, and badminton are classified as *net* games. In net games, players try to send the ball into the court on the other side of the net in such a way that the other team cannot return it. Baseball and kickball are *fielding* games, and golf, bowling, and archery are *target* games. Nearly any sport may be classified as an invasion, net, fielding, or target game. Each classification shares fundamental objectives and strategies which must be understood to play the game effectively.

Most sports require high skill levels for even moderate success. In Teaching for Understanding, however, the teacher modifies the sport to fit the students' developmental levels. The teacher further modifies the sport by designing a game to emphasize a fundamental concept (Thorpe & Bunker, 1989). By playing these games, students challenge themselves and one another

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as they concentrate on game strategies rather than correct skill performance.

Teaching for Understanding can be used successfully with even very young elementary school students. Because students work in pairs or small groups, they can be active throughout the class period and have plenty of opportunities to practice skills in the context of a game. The physical demands of each game are simple, so students can practice the skills but focus on the cognitive challenges of each new game situation. In short, the teacher presents a series of simplified games so that students can learn what to do in a game and why while they practice motor skills specific to that game.

Sequence Examples of Teaching for Understanding

The following two sequences illustrate how Teaching for Understanding units might be taught. In the first unit, hoops and beanbags are used to teach the fundamental concepts of goal play in invasion games (figures 1 and 2). The second unit, a modification of the hoop activity, shows how a teacher might introduce those concepts in the more traditional sport of floor hockey (figures 3 and 4). The hoop unit requires about five class periods, and depending on the students' abilities, the hockey unit should also last about five periods. Both of these sequences have been used successful in first and second grade classes.

Invasion games goal play: Hoops and beanbags (figure 1). An activity using hoops in a one-on-one situation can serve as the groundwork for many invasion games. These hoop games simply involve one player trying all possible ways to toss a beanbag into a hoop, while the other player tries to prevent a successful toss. This game sequence focuses on scoring and defending rather than possession play. Students receive tangible evidence of their success when they score or prevent a goal, making it easier for lower elementary students to understand basic concepts of offense and defense. The more complicated concepts of possession and invasion can be taught once students understand how to score and prevent a goal.

Start the sequence with a cooperative scoring game. This allows the teacher to make an assessment of the students' motor skill levels. If students have a high degree of success in simple beanbag tossing, they should be able to proceed to the four-game progression of strategy play (figure 2).

Game 1. In the first game, offensive players are restricted to tossing the beanbag from behind a line, limiting them to only a few strategic choices, such as throwing high, low, or faking.

Game 2. In Game 2, offensive players are allowed to enter into an area closer to the hoop, giving them the

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Skill Assessment: 2 players, 1 hoop, a beanbag, cooperative scoring game.
A hoop should be located several yards from a line. Players attempt to toss a beanbag into the hoop. One player tosses from behind the line while the other retrieves. Players switch after one turn. Score one point for each successful attempt. Add scores together. Move to the next game when students can demonstrate reasonable control in sending the beanbag to the hoop.

Game 1: 2 opposing players, 1 hoop, 1 beanbag, cooperative or individual scoring.
A hoop is located several yards from a line. One player stands between his or her opponent and the hoop. The other player stands behind the line and attempts to toss the beanbag past the opponent into the hoop. Opponent tries to prevent the goal. Score one point for each successful attempt. Score can be counted for each player or added together. Players switch after each shot on goal.

Game 2: 2 opposing players, 2 hoops, 1 beanbag, line restriction.
This activity is similar to 1, except that there are 2 hoops placed to make a wide goal. Defending player must now protect two hoops while the other player has a choice of either hoop as a goal. Players switch after each shot on goal. Keep score cooperatively or individually.

Game 3: 2 opposing players, 1 hoop, 1 beanbag, no line restriction.
The activity is the same as 1 (using the smaller goal), but the offensive player is no longer restricted to tossing from behind the line. He/she may now enter the playing area around the hoop while attempting to score. At no time can anyone step inside the hoop. All play must begin from behind the line. Players switch after each shot on goal.

Game 4: 3 players, 1 hoop, no line restriction.
One player stands between the hoop and the opponents. Two players play offense: one stands behind the line with the beanbag while the other stands somewhere between the line and the hoop. The two offensive players now attempt to score by either tossing the beanbag into the hoop or by passing to one another before tossing into the goal. Players switch after each shot on goal.

Figure 1. Basic Invasion Games Goal Play Sequence

same strategic choices as before but allowing more freedom to move and additional strategies that can be created by this movement.

Game 3. Game 3 involves a second hoop, making a larger area and allowing more scoring possibilities.

Game 4. In Game 4, a second offensive player is added, allowing students to shoot, move, or pass to a teammate.

This four-game progression provides defensive situations as well. The student protecting the hoop responds to a simple problem by positioning his or her body in front of the hoop and knocking down or intercepting the toss. In Games, 2, 3, and 4, the defender must respond not only to the toss, but to the opponent's movement.

	OFFENSE **Game Problem (P) and Solution (S)**	**Questions (Q)**	**DEFENSE** **Game Problem (P) and Solutions (S)**	**Questions (Q)**
Assessment	P: Take turns with your partner tossing the beanbag into the hoop while standing behind the line. S: Underhand tosses	**Q: How many goals can you and your partner make? What are some of the different ways of tossing the bean bag?**		
Game 1	P: Toss beanbag into the hoop while standing behind a line. S: Toss high, low, between the legs, try to fake.	**Q: What can you do? What should you look for? If your opponent is close to you, what can you do? If your opponent is far from you, what can you do? If your opponent's legs are open, what can you do? How can you trick your opponent?**	P: Stop partner from scoring. S: Place body between partner and hoop. Be in a ready position. Keep eyes on the beanbag. Be ready to move up, down, side-to-side.	Q: What can you do? Where should you stand? What should you be watching? How should you stand? Where should you move? When should you move? Can you trick your partner?
Game 2	P: Toss beanbag into the hoop while moving around the hoop. S: Toss high, low, between the legs, fake, move quickly, change directions quickly.	**Q: What can you do if your opponent is in a low level? with legs apart? How can you get away from (lose) your opponent? How can you draw your opponent away from the hoop? Where should you move?**	P: Stop opponent from scoring. S:Same as 1, but move quickly and change directions, always keeping body between opponent and the hoop.	Q: What can you do? Where should you stand? What should you be watching? How should you stand? Where should you move? When should you move? Can you trick your partner?
Game 3	P: Toss beanbag into one of the two hoops while standing hehind the line. S: Toss high, low, through the legs, toss to one side or the other, fake.	**Q: What can you do? What should you look for? If your opponent is in front of one hoop, where can you toss the beanbag?**	P: Stop opponent from scoring. S: Same as 1, but add standing in middle in front of both hoops watching carefully and moving quickly from side to side, as well as front to back. Always return to middle.	Q: What can you do? Where should you stand? What should you be watching? How should you stand? Where should you move? When should you move? Can you trick your partner?
Game 4	P: Toss beanbag into the hoop while standing behind the line, or moving around hoop. S: Use your partner to help trick your opponent.	**Q: What can you do? What should you look for? When should you toss, move with the bean bag, or pass? Where should you stand or move if you have the beanbag? Where should you stand or move if you don't have the beanbag?**	P: Stop opponent from scoring. S: Same as 1, but add watching beanbag, not players.	**Q: What can you do? Where should you stand? What should you be watching? How should you stand? Where should you move? When should you move? Can you trick your partner?**

Figure 2. Hoops and Beanbag—Four-game Progression of Strategy Play

Invasion games goal play: Floor hockey. Because the hoop activity shares fundamental strategies with invasion games such as hockey, basketball, soccer, and lacrosse, understanding the hoop activity contributes to understanding other games in that group. Different motor skills are used, such as stick handling in hockey or dribbling in soccer, but concepts of the game remain the same. Figues 3 and 4 describe a hockey unit which can be taught to students after they participate in the hoop unit.

During each of the games, two fundamental problems are presented to the class: how to toss the beanbag (or shoot the puck) past your opponent into the goal, and how to stop your opponent from scoring a goal. These two problems represent the easiest fundamental concepts in invasion games. Once these problems and a variety of solutions are mastered by students, teachers should plan to move to the more difficult concepts of possession and invasion play. These concepts are usually taught through a sequence of games starting with "Monkey-in-the-Middle" and other two-on-one or three-on-two games. Understanding how to maintain or gain possession, and then how to invade a defender's territory, requires a carefully designed sequence of games.

Designing Teaching for Understanding Units

Set up "problems" to teach concepts. When using the Teaching for Understanding approach, a teacher must consider which game concept students should understand and focus the lesson activities accordingly. The games which make up the lesson activities should be set up as problems in need of solutions. As students play the game, they act out solutions using game-related motor skills. Through this process, each child becomes involved in the excitement of game decision making, thinking about what he or she needs to do to defend or score.

Talk about students' solutions. After the students have tried the game, the teacher should allow them to think about what they did and why. After asking questions such as, What did you do? Why did you do that? How did you know when to do that? and What did you look for? and discussing some of the students' answers, the students should be allowed to try the same activity again, this time practicing old solutions and trying some new ones learned from classmates.

Skills Assessment: 2 players, cooperative scoring game.

Two cones are used to create a goal. The goal is located several yards from a line. An appropriately sized hockey stick and foam puck or foam frisbee are used so that controlling the puck is easy. Players attempt to shoot the puck into the goal. One player shoots while the other retrieves. Players take turns with equipment after one try, score one point for each goal they make, adding their scores together. Move to the next game when students demonstrate reasonable control in sending the puck into the goal.

Game 1: 2 opposing players, small goal with line restriction, collective or individual scoring.
The goal is located several yards from a line. Each players has his or her own stick. One players stands between the goal and his or her opponent. The other player stands behind the line and attempts to shoot the puck past the opponent into the goal. One point is scored for each successful goal. Scores can be counted for each player or kept collectively, counting all goals while on offense. Players switch places after each attempt.

Game 2: 2 opposing players, wide goal, line restriction, collective or individual scoring.
This activity is the same as 1, except the cones are moved farther apart to create a larger goal, i.e., easier offense, but harder defense.

Game 3: 2 opposing players, small goal, no line restriction, individual scoring.
This activity is the same as 1 (using the smaller goal), but the offensive player is no longer restricted to shooting from behind the line. He/she may now stick handle into the area in front of the goal to take a shot. Caution students, or, if necessary, add a rule (i.e., penalty area or crease) for the safety of the person playing defense. Players switch positions after each shot on goal.

Game 4: 3 players, wide goal, line restriction.
One player stands between the goal and his or her opponents. Two players play offense: one player stands with the puck behind the line, the other stands somewhere between the goal and the line. The two offensive players attempt to score by either shooting or passing and then shooting. Players switch after each shot on goal.

Figure 3. Invasion Games Goal Play: Hockey Sequence

Introduce motor skills, simplest skills first. As the teacher creates activities designed to teach game concepts, he or she must be aware of the motor skills students need to play successfully. The games must be presented in a progression, introducing one motor skill at a time, beginning with the simplest skills, For example, in the hockey sequence shown in figure 3, Game 1 requires only the skill of shooting (or goal keeping). Game 2 requires shooting and stick handling (or goal keeping) in order to play. Sometimes it is necessary to do a skill assessment and a quick individual skill practice before teaching the next game. By beginning with the simplest skill and setting rules, the teacher can limit the skills students use to solve the problem. This allows students to explore all the strategic possibilities with one skill before adding another skill, and it eliminates any problems associated with a lack of proficiency in multiple skills.

	Offense **Game Problem (P) and Solution (S)**	**Questions (Q)**	**Defense** **Game Problem (P) and Solution (S)**	**Questions (Q)**
Assessment	P: Take turns with your partner shooting the puck into the goal between the cones while standing behind the line. S: See how many goals you and your partner can make.	**Q: What are some different ways to shoot the puck into the goal?**		
Game 1	P: Shoot puck by opponent into goal while standing behind line. S: Shoot into corners, through legs, over or under stick.	**Q: What can you do? What should you look for? Where can you aim when your opponent's feet are apart? Where can you shoot if your opponent is in the middle?**	P: Stop partner from scoring. S: Place body in center of goal. Stand in ready position. Keep eyes on the puck, legs together, stick blade on the floor.	**Q: How can you stop the puck before it enters the goal? Where should you start? What should you watch? How should you stand? When should you move? How can you trick your partner?**
Game 2	P: Shoot puck by opponent into larger goal while standing behind line. S: Same is in 1, fake.	**Q: What can you do if your opponent moves to one side of the goal? How can you trick your opponent?**	P: Stop opponent from scoring. S: Same as above, and move out to cut off opponent's angle.	**Q: How can you stop the puck before it enters the goal? Where should you start? What should you watch? How should you stand? When should you move? How can you trick your partner?**
Game 3	P: Shoot puck into goal or stick handle closer to goal and shoot. S: Same as above, use fakes, quickly change directions.	**Q: How can you trick your opponent now (with movement)? How can you make your opponent move out of the goal to give you space?**	P: Stop opponent from scoring. S: Same as above, but move quickly, watch puck closely, by ready for fake.	**Q: How can you stop the puck before it enters the goal? Where should you start? What should you watch? How should you stand? When should you move? How can you trick your partner?**
Game 4	Shoot puck into goal, or stick handle before shooting, or pass to another person (and same as above). S: Draw opponent away from goal, fake with changes in direction.	**Q: How can you and your teammate trick your goalie? When is it a good idea to pass rather then shoot? Where can you stand to help your teammate score a goal? How can you fake?**	P: Stop opponent from scoring. S: Same as above, watch puck, not players.	**Q: How can you stop the puck before it enters the goal? Where should you start? What should you watch? How should you stand? When should you move? How can you trick your partner?**

Figure 4. Floor Hockey—Four-game Progression of Strategy Play

Increase game complexity for some students. A teacher can easily design games for lower elementary students by limiting the skills used and making sure skills are age-appropriate while exploring the concepts of the game. For older or more skilled students, teachers can increase the complexity of the game by allowing them to use additional skills. More advanced games can be designed by adding more players and/or changing the type of equipment used, size and shape of the playing area, or rules of the game. For example, after Game 4 in the hockey sequence (figure 3), two more players can be added to create a two-on-two game. The motor skills needed to play this game are passing, stick handling, shooting, and goal keeping. The primary strategic concept is goal play, and because of the additional players the concept of invasion can be introduced.

Teacher/Student Interaction During the Units

Discussing the students' solutions is an integral part of the Teaching for Understanding method. Presenting problems (such as those in figures 2 and 4) can prompt students to think about and verbalize solutions. Discussion reinforces students' ideas and helps them decide what they need to do to be successful in the game. Through discussion, teachers may also discover solutions they hadn't previously considered.

The teacher must decide when to talk about an activity by taking cues from the students. After a new activity, the teacher can check students' understanding of the concept or strategy. If students are having difficulty understanding, the teacher can gather students together for discussion. The teacher can then restate the problem, present it in a new way, demonstrate solutions, or have students demonstrate solutions.

Additional Points on Teaching for Understanding.

The main purpose of these units is to teach the students the basic offensive and defensive strategies of invasion games. To prevent frustration, students should clearly understand the choices they can make in a simple game before the game becomes complicated with more equipment, different skills, or adding a third player. Teachers need to observe students' actions carefully, recognizing appropriate offensive and defensive strategies as students discover them. Examples of basic strategies are listed as "Solutions" in figures 2 and 4.

Teachers must recognize students' limitations. If the activity is too difficult or not challenging enough, behavior problems can arise. When students appear frustrated or bored, changing the rules, changing to simpler equipment, or returning to an easier game may be necessary.

Each unit can only go so far and can only include as many skills as the students are capable of performing and understanding. Teachers must "read" their students to know when to stop the unit and move on to another. In a new unit, the same strategic concepts of the previous unit can be reinforced while new motor skills are being developed.

Teachers who want to try this approach should know that Teaching for Understanding will work best when teachers can:

1. Understand sports well enough to create game-like learning situations.
2. Manage a class of students in pairs and small groups.
3. Observe and listen to students in order to ask appropriate questions and adjust activities,
4. Focus on verbal and motor solutions to the problem and not simply correct skill performance.

Teachers who try this approach may find that behavior problems decrease. This improved behavior results from children playing games in pairs or small groups and because playing games that require thinking is more interesting than performing skill drills. Furthermore, students with high and low levels of skill can be challenged to practice and use their skills when a concept is the focus of the lesson.

References

Bunker, D., & Thorpe, R. (1982). A model for the teaching of games in secondary schools. *Bulletin of Physical Education*, 19(1), 5-8.

Thorpe, R., & Bunker, D. (1989). A changing focus in games teaching. In L. Almond (Ed.), *The place of physical education in schools* (pp. 42-71). London: Kogan Page Ltd.

Werner, P. (1989). Teaching games: A tactical perspective. *Journal of Physical Education, Recreation and Dance*, 60(3), 97-101.

Werner, P., & Almond, L. (1990). Models of games education. *Journal of Physical Education, Recreation and Dance*, 6(4), 23-27.

The Children, Not the Games

Stan Kulewicz

Games education in many schools exemplifies the tired, unimaginative habits stunting the growth of American education. The conventional games approach is highly structured, inflexible, competitive in a negative sense, and generally unhealthy. Although a misguided approach to games education does not permeate all education, it is the reality faced by too many youngsters in American schools.

Games education traditionally begins with low-organization activities and skill development (chasing, fleeing, dodging, and throwing), proceeds to lead-up games, and culminates in product- and point-oriented team sports such as baseball, basketball, or football. Recent research, however (Bird, Cripe, & Morrison, 1980), proposes that the competitive structure in which most children are taught to play games "is intimately involved with and perhaps somewhat responsible for many of the problems associated with stress" (p. 28). Rather than helping relieve tensions, competitive games rub salt into psychological wounds.

With their intense competition, traditional games repeatedly expose children to the stresses of normative social comparison, opening children to the detrimental effects of negative peer and/or adult evaluation. Roberts (1980) has noted that during the ages from five to twelve a child's most important referent for determining abilities is the peer group. Doing well in sporting activities is especially important in the identity formation of American boys. Because children judge their own competence and self-worth through social comparison, children who consistently receive unfavorable evaluations from peers, coaches, parents, and teachers develop what has been labeled "sports learned helplessness" (Roberts, 1977).

The children who perceive themselves as incompetent in sports, and who feel unable to change this status, often decide to drop out of sporting activities completely (Roberts, 1980). "This decision may arouse trauma within the child and generate low confidence and self-concept" (p. 44). Thus children taught and encouraged to compete against each other often do so at the expense of other players' physical, emotional, and psychological well-being.

Children are taught to feel that winning or losing a game is more important than the effort players expend. In studies where children were asked to award stars to peers who showed success or failure, ability or effort in a game, they relied on different cues at different ages (Salili, Maehr, & Gillmore, 1976; Weiner & Peter, 1973). Children under ten made awards on the basis of outcome alone, ignoring effort and ability factors. Among children ten through twelve years old, however, the player's effort became the most important consideration in giving awards. American children aged 13 and over again shift their reasoning, considering outcome as the most important reward criterion. American children were unique in this shift; a parallel study of youth of other cultures shows them to award effort over outcome. Somehow American children learn that accumulating points is the essential concern, while the efforts of a game are less important.

Again and again, children of lower playing ability are segregated from the high status circles of the athletically elite. The competitive process generates self-shattering discouragement, disillusionment, and distrust. Children whose developmental movement skills lag, or who lack the confidence to assert their ability are denied the education they need. They are robbed of the opportunity to refine and improve their playing. Cognitive,

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Drawing Heidi Johanna Selig. From the Inside Out

social, psychomotor, moral, and affective growth opportunities inherent in the social nature of games are denied to children of lower ability.

If schools are to provide educational programs to meet the needs and abilities of all students, the traditional approach to games education must surrender itself to a more enlightened mission. Rather than confining the rewards of games to an elite group of high achievers alone, games education must open itself to all children. Too many children are denied the emotional joy of playing and the physical integrity of a well-exercised and well-played body. In light of the abundance of meaningful and humane games environments (Orlick; Morris; Nonviolence and Children Program; New Games Foundation), the time to change the focus of games is now.

Adults who continually impose their own system of organization and control upon children must be the first to change. Children should be organized less according to adults' standards and more according to their own. Young children view competition differently from adults (Roberts, 1980), and do not understand that effort as well as some degree of ability are necessary for success. Not until about 13 years of age do children show a mature understanding of winning and losing (Roberts, 1980). Yet children are pushed into competitive sports long before they have the cognitive maturity to understand the competitive process. Young children may display satisfaction with their efforts to play in a game, even if their lack of ability merits a "loss." Thus such children are confused and unsure of themselves when they are harangued by coaches and others for "losing" (Roberts, 1980).

Instead of fitting children to traditional competitive games, games teaching must respect each child's unique capabilities, including learning style, learning rate, physical size, level of conditioning, and emotional stability. Professing such a philosophy eliminates many practices of conventional games instruction: one game for the entire class; domination by stronger, quicker, more able children; outcome stressed above effort. Confidence and success for all students should be a part of the games environment.

Morris' Games Analysis model (1976) serves as a viable framework with which to structure games, adapting the current needs of the playing group to variables such as number of players, equipment required, movement patterns, organizational patterns, limitations, and purpose of game. Empirical findings (Riley, 1975) support the value of teacher-designed, teacher/student-designed, and student-designed games for educating children to enjoy play.

In at least one study (Marlowe, 1980), the social prestige and acceptance of children with poor movement ability was elevated using the games analysis framework. Socially isolated children who were instructed in the games analysis framework achieved greater peer acceptance, as illustrated by higher sociometric ratings, than isolated children instructed in a traditional physical education games curriculum. Thus the psychological needs for belonging and acceptance necessary to higher levels of growth and development (Maslow, 1962) were fulfilled for students who otherwise would have been closed to higher levels of self-actualization.

Terry D. Orlick (1977) has written, "Our children have become casualties to competitive insanity" (p. 33). While this is not the fault of the schools alone, our educational institutions do little to foster the cooperative spirit. The schools must offer what society does not. Cooperation, involvement, acceptance, and enjoyment must replace the competitive games played in our schools. Not all children have the social, emotional, or physiological ability to be captains of their teams, but all children have the right and the need to play.

Rather than asking children "Who won?" it is healthier to encourage the efforts of all players. Must we impose our adult standards upon the children we are trying to educate to be self-fulfilled individuals? Must we extinguish the joy of childhood games playing? Games should be enjoyed by and available to all children. Educators cannot afford to play around with the implications of the competitive process.

Games in American schools have become more important than the children playing them. This tragic injustice must cease. There is no reason for the unsound traditions of games education to continue as the *only* framework for children's games.

While years of tradition cannot and will not be swiftly surrendered, educators must expose children to alternatives in games playing. It is time to allow all children to become as skilled, active, and interested in games as they can become. Games education has an unflattering record of separating those who can play from those who allegedly cannot. It is time to leave behind the sour habits of traditional games and introduce the humane spirit that begins not with the games, but with children.

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References

Bird, Anne Marie, Cripe, Bernette K., & Morrison, Nettie L. Children and Stress, *Journal of Physical Education and Recreation*, 51(5), 1980, pp. 28-29.

Greene, Maxine. *Existential encounters for teachers*. New York: Random House, 1967.

Harrison, Marta, and the Nonviolence and Children Program. *For the Fun of It: Selected Cooperative Games*. Philadelphia: Friends Peace Committee, 1976.

Marlowe, Mike. Games analysis intervention: A procedure to increase peer acceptance of socially isolated children. *Research Quarterly for Exercise and Sport*, 51(2), 1980, pp. 422-426.

Maslow, Abraham H. *Toward a psychology of being*. New York: D. Van Nostrand Company, 1968.

Morris, G.S. Don. *How to change the games children play*. Minneapolis: Burgess Publishing Company, 1976.

New Games Foundation. *The New Games book*. Garden City, NY: Dolphin Books, 1976.

Orlick, T. D. Cooperative games. *Journal of Physical Education and Recreation*, 48(7), 1977, pp. 33-35.

Orlick, Terry. *The cooperative sports andgames book*. New York: Pantheon Books, 1978.

Riley, Marie. Games and humanism. *Journal of Physical Education and Recreation*, 45(1), 1975, pp. 46-49.

Roberts G.C. Children in competition: Assignment of responsibility for winning and losing. Proceedings of the NCPEAM, 1977a, pp. 328-340, cited by Roberts, Glyn C., Children in competition: A theoretical perspective and recommendations for practice, *Motor Skills: Theory into Practice*, 4(1), 1980, pp. 37-50.

Roberts, Glyn C. Children in competition: A theoretical perspective and recommendations for practice. *Motor Skills: Theory into Practice*, 4(1), 1980.

Salili, F., Maehr, M.L., & Gillmore, G. Achievement and morality: A cross-cultural analysis of causal attribution and evaluation. *Journal of Personality and Social Psychology*, 33, 1976, pp. 327-337, cited by Roberts, 1980.

Weiner, B., & Peter, N. A Cognitive-developmental analysis of achievement and moral judgments. *Developmental Psychology*, 9, 1973, pp. 299-309, cited by Roberts, 1980, op.cit.

Elementary School Dance: Teaching Rhythms and Educational Forms

Our culture's interest in music, movement, and rhythm does not appear to be emphasized in our physical education programs. There is a definite need to implement a sound, theory-based, practical program in our elementary schools.

C. Andrea Brown

Our culture reflects both interest and pleasure in rhythm as experienced in music, sound, and movement. Many cultural "heroes" are musicians. The Live Aid and Farm Aid concerts of the 1985 summer indicated that our population can be motivated through music. Exercising to music has become a dominant factor in the lifestyles of many people. Such interest in music and rhythm does not appear to be limited to any one segment of our population. There are not many second grade children who have not heard of popular singers such as Michael Jackson or Bruce Springsteen.

This interest in music, movement, and rhythm does not appear to be emphasized or reflected in the physical education and movement programs in our schools. Various reasons to explain this situation include the lack of personal experience of the teacher (Graham et al., 1980), boys don't like "dance," or "there is not sufficient time to do everything." Yet the generalization can be made that *most* children at a young age appear to enjoy creative movement and have some sense of rhythm.

Corbin (1976) states that differences between sexes with respect to movement in children can be overshadowed by individual differences within each sex and age group. Wickstrom (1970) suggests that some children do not enjoy rhythms because they lack experiences, practice, and affirmation of their performance. He also indicates that children, after the age of six years, tend to spend time refining their fundamental skills rather than learning new skills. These ideas echo those of Preston (1973), a pioneer in creative dance, who states that the desire to move (in a creative manner) decreases in the primary school years if it is not fostered.

There are many methods and approaches to presenting rhythms and educational dance. Structured forms of rhythmic movement can be presented in order to teach the rhythm itself, a specific skill, or a specific dance. Less structured or creative forms of rhythm and movement can provide students with opportunities, experiences, and challenges in terms of expression, creativity, and problem solving. Whatever the approach for organizing these experiences, professional physical educators must come to terms with the potential of rhythms and educational dance for children.

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There is a definite need to implement a sound, theory-based, practical program in our elementary schools. The program should be based on a framework that allows for the analysis of all forms of movement, and which facilitates the teaching of both creative and structured movement, with an emphasis on rhythmic factors. The remainder of this article is a brief proposal of such a program.

Movement framework—design basis

The body of knowledge in physical education includes a framework which could be used for this type of program (Russell, 1975). The Laban framework describes movement in terms of four major elements of awareness: body, space, effort, and relationship. These four elements can be further defined by a number of variables (see Figure 1). The *body*, as the vehicle of movement and expression, consists of activities, actions, shapes, and parts. *Effort* describes the quality of these movements in terms of time, weight, space, and flow. *Space* describes where the body can move and includes levels, directions, extensions, floor and air patterns. The body moves with effort, in space, in *relationship* to its own body parts, other people, sounds, and props. Consequently, it is possible to design a medley of movement experiences based on permutations within the framework (i.e., walking, an activity of the body, modified in terms of space: walking with small steps or large steps, straight or curved). If a variable of relationship is added to this particular permutation, then the number of movement possibilities will increase.

Such permutations, which can be developed for all dimensions of the framework, become the basis for designing experiences and tasks for children. Experience with each permutation provides the children with a new means of expression. For example, as children learn to run and spin, they can be challenged to change their movement by adding other framework variables such as acceleration and/or body shape.

These permutations can be presented in one of two ways: children can be taught a structured dance or predesigned movements, or they can be presented with

Figure 1. Suggested Plan for Teaching Variables within the Movement Framework

	P/K	1/2	3/4	5/6
Awareness of the Body				
Locomotor movements (simple)	•	•	•	•
Locomotor movements (complex)		•	•	•
Manipulative skills		•	•	•
Gestures		•	•	•
Body parts (identification)	•			
Body parts (leading action)	•	•	•	•
Body parts (bearing weight)	•	•	•	•
Body shape (size)	•	•	•	•
Body shape (straight, etc.)	•	•	•	•
Body shape (symmetrical, etc.)		•	•	•
Awareness of Space				
Extension	•	•	•	•
Direction	•	•	•	•
Levels		•	•	•
Air pattern				•
Floor pathway		•	•	•
Awareness of Effort (Force)				
Weight	•	•	•	•
Time	•	•	•	•
Space			•	•
Flow			•	•
Awareness of Relationships				
Body parts to other parts	•	•	•	•
Self to other individuals		•	•	•
Self to group			•	•
To apparatus (equipment)	•	•	•	•
To cultural events, stories, etc.	•	•	•	•
To rhythmic factors	•	•	•	•

open-ended questions designed to foster creative responses; e.g., "show me how you can use large steps in a heavy fashion to put an accent in the even rhythm." Both of these kinds of presentations should be provided for children.

As the children increase their movement vocabulary, ability, and level of control, more awareness of variables can be introduced. As soon as the children become familiar with the expectations of the less structured or creative portions of their lessons, they will begin to experiment with their own permutations. Eventually the task itself may be to develop a sequence and, in time, an original dance. This objective, in its simplest form, can be completed by preschool and kindergarten students as well as fifth and sixth grade students.

Rhythmic framework

Movement can be influenced profoundly by relationships to rhythmic factors. There are seven factors of rhythm which can affect sound and movement. These factors include beat, accent, measure, tempo, duration, rhythmic pattern, and rhythmic phrase (see Figure 2).

Figure 2.
The Seven Basic
Rhythmic Factors*

1. Beat/pulse: the usually regular and constant "feel" of the sound.
2. Accent: the factor of strength or weakness which is typically regular and evident in the sound.
3. Measure: the result of dividing the beat by accents on a regular basis.
4. Tempo: The rate at which pulses, beats, and often accents occur in the sound.
5. Duration: the length of time during which sound or stillness may occur.
6. Pattern: the sequence of durations often divided by accents.
7. Phrase: the natural grouping of sounds which seem to go together.

*(Brown and Goc-Karp, 1985)

Figure 3.
Suggested Plan for Teaching the Rhythmic Factors

Rhythmic Factor	P/K	1/2	3/4	5/6
Beat/pulse	I	D	R	E
Accent		I	D	R
Measure		I/D	R	R
Tempo	I	D	R	R
Duration	I	D	R	R
Pattern	I	D	D	R
Phrase		I	D	D

I = introduce D = develop R = review E = emphasize

For example, an increase in the tempo of music or any other sound can be a cue to increase the rate of movement. Make-up of the rhythmic pattern can be a cue as to variations within a movement. Children could thus be given many varied opportunities to develop or change their movements as cued by music and/or sounds.

Students can be asked to identify and emphasize the rhythm of specific movements they are performing. The rhythm of these movements can be emphasized, adapted, or changed. For example, questions could be raised concerning the rhythm of leaping, followed by a task to emphasize the accent. Once this rhythmic pattern is established, the students could be asked to repeat the pattern with another body part or with another person. Thus, the rhythmic framework can be integrated into the awareness of relationships with the movement framework.

Children can be introduced to relationships with rhythmic factors when they begin to develop the skills which require such rhythms for effective movement, or when they appear to be ready to integrate the factors into their existing movement vocabularies. Generally children are ready to use and/or apply these factors in the early grades of elementary school (see Figure 3).

The purpose of rhythms and educational dance is not to train dancers. It is to provide opportunities for children to experience, move, and create a variety of rhythmic movements and patterns. These experiences can be presented in many forms. Forms suggested here are creative rhythms, creative dance, folk and international dance, dancercise, and social dance. These forms were identified by Brown and Goc-Karp (1985) as being most appropriate for elementary school aged children. Although suggestions can be made as to when each form could be introduced to children, the emphasis and content of each form must be varied according to the needs, interests, and abilities of the children (see Figure 4).

Figure 4.
Suggestions for Teaching the Different Forms of Rhythms and Dance Activities

	P	K	1	2	3	4	5	6
Creative Rhythms	•	•	•	•	•	•		
Creative Dance	•	•	•	•	•	•	•	•
Folk/International Dance				•	•	•	•	•
Dancercise							•	•
Social Dance								•

Forms of rhythm and dance

Creative rhythms is a form of movement which emphasizes rhythmic factors of beat, accent, duration, etc. The correct response is one that displays accurate rhythmic movement. There can be more than one correct movement, but it is always secondary to the rhythmic factor. A typical progression of tasks for second grade children in creative rhythms is:

> Clap hands or stomp feet to a given beat.
> Walk to the same beat.
> Walk and change direction, still maintaining the beat.
> Bounce a ball to the same beat.
> Walk and bounce the ball to the beat.
> Walk, bounce the ball, change directions to the beat.

Creative dance is a form of communication and expression rather than a specific response to a given set of instructions. Children need to be presented with exploratory experiences in order to develop a movement vocabulary, which will then allow them to increase their abilities in communication and expression. Typical of such exploratory activities is the following series of tasks:

> You have been running to the music. Now show me how you can run, and increase the distance you are covering, still using the same amount of time.
> How are your legs and feet helping you to do this task?
> What are your arms doing to help you complete the task?
> Show me a different way you can complete the task.
>
> or
>
> Tell me about peanut butter. What would it be like to walk on a floor covered in peanut butter? Show me.
> You have arrived at a rodeo, you see some bucking broncos. Tell me about their movements. Show me how you can make these same kind of movements.
> Today we are going to make a machine. What will our machine do? What size is our machine? Describe some of the parts inside the machine. Now show me these things.

Children will respond to these tasks in a variety of ways, the important point being that they are given opportunities to move, express, and develop their own unique responses to ideas and concepts.

A major characteristic of this form of dance is the design and performance of child-created dances. Preschool children will be able to clap their hands or stamp their feet to a simple beat. They can be challenged by being asked to move other parts of their bodies to the same beat. As these two movements are put together, a simple sequence is developed. Older students who have experiences in creative movement could be asked to develop a sequence, such as contrasting crowd movements at a rock concert and a symphony concert. Once these dances are completed, they may be refined and, as such, become a form of structured movement having a format and style to which all performers must conform.

Folk and international dance, as developed from cultural and community activities, has always been a vital part of the human condition. International dances are simply refined forms of creative and expressive movements depicting values, beliefs, traditions, and feelings of people who lived before us. As their movements were repeated over the years, specific styles, etiquette, and dances emerged.

Egyptian tombs depict male dancers leaping to express happiness. The well-known tarantella dances from Sicily originated from townspeople expressing their fear and concern of the tarantula spider (Jensen & Jensen, 1966). Lithuanian dances tell of the agricultural activities of the peasants. The hand-clapping dance from Austria tells about the work activities of the blacksmith.

This form of structured rhythm and movement may be taught to children. The movements will have much more meaning if presented in terms of their original purpose and development. However, there is also a more creative approach which can be made to international rhythms and movement. Think about asking your students to do the following:

> Design a movement sequence based on the lifestyles of the people we have discussed in class who live on the Mississippi.
> Having worked on movement sequences showing the work occupations of the people who built the Great Wall of China, choose two of them and use the shape of China as a floor pattern.
> Keep the form and rhythm of the dance we have

reviewed, but change the body parts used to emphasize the rhythm. Consequently, both structured and creative international rhythm and movement experiences can be designed for children.

Dancercise is simply exercise to music, a form of rhythmic movement, not dance; it is a series of repeated movement patterns which is put to music for the purpose of maximizing activity. The patterns and exercises, determined by the needs of the students, are usually put to music provided by the students.

The most recent and popular approach to dancercise is aerobics. Most children of this age do not require an aerobic program and an elementary physical education schedule is not usually set up to facilitate such an approach. However, many educators believe fifth and sixth grade students need to be provided with examples of the exercises and sequences currently used in aerobic programs. Initially, dancercise programs can be either creative or structured. Eventually, a structured form will be developed as the students copy and/or develop patterns of movement which can be repeated.

Social dance is a term used here to describe a form of dance in the United States which is either currently popular or historically significant, and which is open to some form of interpretation and expression. The degree of structure in social dance is dependent on the dance itself. Over the years, dances such as ballroom dancing, or the Charleston, the Watusi, and the Jerk have met this criteria. Current forms of Break Dance and Country Swing now meet the criteria.

Children in elementary school may not be ready to tackle advanced forms of such dances, but they can master simplified versions. These simplified versions may reflect the movement qualities of rhythm of the original dance. It is important to retain the character of the dance as it is adapted and simplified to meet the needs, interests, and skills of the students.

Implementation of a program

Children develop at their own rate and do not adhere to a specific set of criteria with respect to their age. However, age-related developmental factors can provide some guidance for the content of a rhythms and dance program through the identification of themes for units. These themes target certain variables of body, space, effort, and relationships awareness. Themes as organizing centers for units encourage teachers to modify lessons according to the needs of their students. The suggestions for themes listed below are intended to assist teachers in developing a coherent rhythms and dance program for children.

Preschool and kindergarten

Children at this stage of development learn through personal experience in play. Movement is often used as a means to gain self-confidence and to practice independence. Typically, young children use their bodies as a major medium of expression. Thus, preschool and kindergarten children will enjoy activities which are directed to combining ideas of the mind and body, using their imagination to create movements. These activities should provide excitement and variation, repetition and fun. When a trust relationship exists in the teaching/learning environment, responses by the children will become immediate and spontaneous. A variety of activities can accelerate the refinement of basic locomotor patterns.

The themes selected for organizing instructional units for children should emphasize body awareness, introduce effort variables, and include the rhythmic factors of even beat, tempo, duration, and simple patterns. Activities can be developed into short sequences as the concept of rhythmic phrase is introduced.

Body activities should include the simple locomotor movements of stepping, running, jumping, and hopping with variations such as spinning, twirling, and rising and sinking. Hands, feet, toes, elbows, and knees can be emphasized in performing these activities.

Children can vary the size of the movements as they travel in *space*, emphasizing general spatial awareness and the directions of forward, backwards, or sideways. Children should be ready to master *effort* variables of quick, slow, and accelerated movements. Weight may be experienced in terms of the contrast between tension and relaxation.

Children at this age tend to be aware of group relationships only in terms of themselves, music or apparatus, or their teacher. Children will respond to many other variables in relation to sound, colors, pictures, poems, stories, and small apparatus especially when they can use their imagination.

Grades one and two

Children at this stage of development are easily fatigued, yet want and enjoy frequent periods of high level activity. They enjoy using their newly found mastery of locomotor skills in highly dramatic, adventurous, and imaginative situations which involve chasing, advancing, rising and sinking, retreating, falling, and fleeing. First and second grade students are curious and need to know, understand, measure, and compare all that they do. They experience problems with some spatial skills, but enjoy activities which include the variables of over, under, around, and through. When ideas capture their attention, they are able to concentrate for long periods of time. Consequently, they enjoy both repetitious activities as well as those that challenge them to go higher and faster. At this stage, they are beginning to play together in small groups.

Themes for their rhythms and dance units should continue to emphasize their awareness of effort and space variables. Rhythmic factors of accent and phrase should be introduced; beat, tempo, duration, and pattern should be practiced. Measure and accent are ideal points of focus in the refinement of *body* movements such as the simple locomotor skills and the more complex skills of skipping, sliding, and leaping.

Body parts begin to lead movements as the children explore permutations of *space* and *effort* including high and low levels, straight and curved floor pathways, and accelerated movements. Children can experience pleasure as they experiment with pathways at the same time as they experiment with light, firm, sustained, and sudden movements. *Relationships* within groups can be addressed as children begin to work together to develop movement and rhythmic phrases that involve pairs or small groups in leading, following, meeting and parting, and passing. Children are motivated and will move in relationship to popular music, rhythm instruments, unusual sounds, ideas, and fictional characters.

Grades three and four

Children at this stage of development are interested in independent activities (such as self-testing) and the development of their ideas and concepts. They tend to be quite assertive and enjoy experiencing a variety of effort variables. They enjoy working together in small groups which emphasize problem solving, competition, and cooperation. As individuals and groups they frequently demonstrate responsibility and sensitivity to others. Structure is important to them and they seek to understand the rationale behind any request made of them.

Themes for their rhythms and dance units should emphasize the variables of body, space, and effort not previously covered. The rhythmic factors of accent and phrase should be developed as measure and pattern are emphasized. With respect to the *body*, children should now be able to distinguish clearly between all locomotor movements and be able to use them in sequences. Symmetrical and asymmetrical shapes are introduced as children differentiate, and then begin to integrate, movements of individual body parts.

Both elevation and extensions are variables of *space* that can be developed while still experimenting with a variety of levels and pathways. *Effort* variables, especially timed with simultaneous and successive movements, can continue to receive focus with the flow variables of bound and free movement. Firm, fine, sudden, and sustained movements are still important experiences for children.

As they begin to master these new and demanding variables, they can begin to develop exciting effort/shape and body/shape movement sequences. The *relationship* variables are important to third and fourth grade children, who find pleasure and excitement in applying their new skills and movements in small group situations. They will enjoy expressing their independence in terms of developing and playing their own rhythms, especially in terms of accent and measure.

Grades five and six

Children at this stage of development sometimes appear to take on adapted attitudes and interests of a lifestyle previously thought to be the prerogative of teenagers. This situation has implications for the content of rhythms and dance. Pop music and pop fads are of interest to many fifth and sixth grade students.

Other relevant characteristics include the students' pride in appearance and apparent dependence on peer opinions. As students recognize the many changes taking place in their bodies, they question their feelings of self-worth; their feelings at times are inconsistent and unreliable. As a result, students are often sensitive to criticism, yet still appreciate adult approval given on an individual basis. Conformity is often more desirable than uniqueness and individual differences.

Students are able to manipulate information and exhibit skills of complex reasoning. They understand functional relationships and can apply complex permutations of the movement framework variables into their activities.

Themes for their rhythms and dance units should emphasize *effort* variables and *body* actions through the variables of weight (firm and fine), time (sudden and sustained), and flow (direct). Students at this age still enjoy the variables of *relationships* in terms of working together as a class or in groups of six to nine persons. They will relate to ideas, music, and sounds which they generate or identify for themselves. *Rhythmic factors* of accent and measure in which patterns and phrases are emphasized should be reviewed.

Summary

Physical eduation must include carefully designed rhythms and dance experiences. By recognizing the various forms these experiences can take (creative rhythms, creative dance, folk dance, dancercise, and social dance) and by organizing these forms to correspond with unit themes, an exciting program can be offered.

For preschool and kindergarten children, it will be a program of creative rhythms and creative dance forms. For first and second grade children, it will include creative rhythms and creative dance, and will introduce some simple folk dance forms. For third and fourth grade children, the program will continue with the creative rhythms, and focus on creative dance and folk dance. In the fifth and sixth grades, creative dance, folk dance, dancercise, and social dance become the expanded focus for content.

The thematic approach to planning units and lessons, typical to the movement education approach, is a sound and practical method for organizing effective program implementation.

References

Brown, C.A., & Goc-Karp, G. (1985). Start here: Elementary physical education for the non-specialist. Unpublished manuscript, Washington State University, Department of Physical Education, Sports and Leisure Studies.

Corbin, C. (1976). *Becoming physically educated in the elementary school*. Philadelphia: Lea & Febiger.

Graham, G., Holt/Hale, S.A., McEwen, T., & Parker, M. (1980). *Children moving: A reflective approach to teaching physical education*. Palo Alto: Mayfield.

Jensen, M., & Jensen, C. (1966). *Folk dancing*. Provo: Brigham Young University Press.

Preston, V. (1973). *A handbook for modern educational dance*. London: MacDonald and Evans.

Russell, J. (1975). *Creative movement and dance for young children*. Boston: Plays.

Wickstrom, R. (1970). *Fundamental motor patterns*. Philadelphia: Lea and Febiger.

Dance and the Developing Child

Susan W. Stinson

Each of us looks at the world from the unique perspective of who we are. So I think it is important, in sharing a perspective, to share something as well of the lenses one is looking through. I am an educator, specifically a dance educator in higher education, where my work focuses on teacher preparation. I continue to teach children as much as possible, as I have for almost 20 years. I am also a mother of two no-longer-young children, who have contributed as much to my understanding of childhood as has my graduate level education. And I am a global citizen concerned about the fragile world we share. These three lenses, and undoubtedly others, have come together to help me to see the picture I will be presenting in this article.

A View of Development

First I would like to look at the implications of the word "development." In many ways I consider myself a developmentalist. I give lectures to my university students on the stages of human development and their implications for teaching dance. I find the concept of development very useful in guiding many aspects of what and how we teach.

But I find it interesting that we use the same word — development — in speaking of countries and cultures that we do in speaking of children. In the United States, we refer to Third World countries as being underdeveloped — or sometimes even "primitive," and our idea of helping them is to have them turn into developed countries, meaning *like us*. Similarly, our desire to have children develop reflects our desire to have them think, speak, and act the way we do. Individuals who are 40 and act like they are 4 are not highly regarded by most of us.

The point of these rather obvious statements is that there is a value judgment implied when we speak of development. We consider it better to be more developed than less developed; development represents a gain, not a loss. Further, the standard and the judgments are based on the perspective of the judger. People from what we refer to as underdeveloped countries might just as well look at the United States and question whether, for example, it is better to have running water come into one's own house when that means one no longer sees one's neighbors at the well.

I am not going to romanticize being without running water, and suggest that we all go "back to nature" in order to have neighborliness. But unless we know what the usual sacrifices are in the process of development, we are not able to think creatively about how we can avoid a great deal of loss as we pursue the gains that come with development.

We are accustomed to looking at young children, just like the Third World countries, as underdeveloped. I would like to suggest that most young children have certain capacities in greater abundance than most adults, and that there is frequently a great deal of loss in terms of these capacities, that parallels the cognitive, affective, and psychomotor gains that come with development. I hope that by identifying some of these capacities, and their value to us in living full human lives, we may be able to — perhaps not have everything — but at least make wiser choices about curriculum for young children.

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The Creative Process

The losses with which I am concerned are ones I might never have recognized had I not chosen to be involved in a creative art form, and come to appreciate that there are different stages involved in the creative process, just as there are different stages in a person's life. Theorists have identified at least four stages in the creative process (see Ghiselin, 1952; Rugg, 1963) but I will be taking a more simplified approach for the purposes of this article.

Usually when we look at art we see only the final form it takes, whether we are looking at a painting in a museum or dance in a theater. Most of us recognize that considerable skill, and usually years of preparation and study, lie behind the final form. A mature artist needs technical skills, the craft of his or her chosen art form. For some arts, these skills may require many years of dedicated practice. One must also be able to stand away from one's own work and look at it critically — analyzing, clarifying, refining. Artists usually study the work of other artists, just as scientists study the work of others in their field, as part of developing those skills. The use of the word "work" is appropriate here; developing technical and analytic skills is a laborious process, and employing these skills in making a refined external product feels like work to most artists.

For those who have not experienced this kind of work in art, it might be compared to writing a paper ... or a keynote address. One spends years developing the skills of writing and critical thinking that are required, not to mention the word processing skills. Getting the right words down, in the right order, to say what we want to say, is clearly not child's play, and involves important skills that students need to learn. The significance of these skills for functioning in today's society has generated pressure on educators to begin them sooner and spend more time working on them.

These parts of the creative process — developing skills and producing a refined product — are essential if our art is to communicate clearly with others; we must be articulate with whatever "language" we choose. However, such work is not the only sort of experience involved in doing art — or any other creative endeavor. We must not only be skillful in communicating; we must have something to communicate.

Ideas and feelings for communicating in art may be initiated by any experience the individual has, implying the need for rich life experiences as part of education. But further, if it is to contribute to the creative process, an experience must become part of the individual in some unique way. It must become *theirs*, internalized as part of the individual's own reality. Most of these internalized ideas and feelings are hidden from conscious awareness. So an important part of the creative process becomes gaining access to the ideas and feelings that are otherwise left locked away. This part of the creative process requires a different state of consciousness than that required for the active work. One must allow it to occur, rather than work at it; in fact, it often feels more like play than work. It is more often messy than orderly. Instead of repetitious practice, one must rely on spontaneity. Because we cannot *make* it happen, there is often a sense of mystery when it does. As the creative form is first emerging, the artist must be immersed in it, rather than standing outside looking critically at it (which happens later). The actor must become the character, knowing him/her from the inside. The dancer must become the dance. This stage involves play, exploration, transformation.

Young children usually excel in play, exploration, and transformation, to a much greater degree than most adults. I first became aware of this as a 12-year-old, when my preschool aged brother would be sent to brush his teeth. An hour later I would find him playing with little puddles of water on the bathroom counter, oblivious to the passage of time and having forgotten the original task. All preschoolers can find untold treasures in a parking lot on the way to the car, most of which go unnoticed and unappreciated by their parents. Young children can change their own identity instantly, and turn a stick or a cardboard box into any number of creations with which they can play for untold hours. They do not, however, possess high levels of analytical and critical thinking skills or complex motor skills. So it is normal that we think in terms of developing the parts that are missing.

But when I look at most adults, it is easy to recognize that the capacities young children possess in such abundance practically disappear by adulthood. University students with whom I work often despair of ever recovering their own inner child — the part that can unself-consciously play, explore, transform. It is almost as if our inner child gets killed so the adult can be there. However, if the inner child were killed in us all, there would be no art, because there would be no source from which art could grow. There would probably not be any science either, since this is another field that requires creative thinking. The question for us as educators, I think, is how can we allow the child to flourish even while adult skills are being developed?

The Reality of Young Children

In order to be able to answer that question it is helpful to think about the reality in which young children live, and the significance of that reality for all of us. One way we can describe such a reality is in terms of its sensory-motor nature. Sensory awareness is an essential aspect of being an artist. For the visual artist, seeing is a critical sense; for the musician, hearing; for the dancer, the kinesthetic sense.

The sensory-motor realm is one in which young children live, to a far greater extent than most of us do as adults. Anyone who has tried to get somewhere with a young child knows that they have an uncanny way of noticing things that we as adults often miss — the procession of ants down the sidewalk, the rock that has something shiny in it. And once young children discover something, they are rarely content with just looking at it. A puddle is for jumping over or into. A craggy hill or a weathered fence is not beautiful scenery; it is something to climb.

The sensory powers of young children sometimes leave me amazed. I remember the day my preschool aged son picked up a bag of clean clothes, hand-me-downs that were being passed on by a friend. He sniffed them and announced, "They're from Matthew. They smell like Matthew's clothes." He was right; they were Matthew's clothes, but I could not smell a thing. I even asked Matthew's mother what kind of detergent she used; it was no different from mine.

On another occasion we were taking a walk outdoors at dusk, playing a "listening game." We took turns stating what we could hear in our neighborhood ... "I hear crickets." "I hear cars on the highway." Finally Ben said, "I hear flowers growing." I thought to myself, "How imaginative" and decided I would speak of an imaginary sound too, so I said "and I hear the moon starting to shine." Ben promptly replied, "Mommy, the moon doesn't make any sound when it shines." But he knew the sound of flowers growing, and in fact was able to imitate for me the very tiny sound he heard.

Now, the rational part of myself would classify these incidents as evidence of a good imagination. But I often have occasion to wonder whether children may have sensory capacities that we adults have lost, because we have learned what is "real" and what is "imaginary."

Sensation fuels the world of feeling, and young children frequently wear their feelings close to the surface. They throw their arms around us spontaneously when in a loving mood, or hold on to our legs when they are too shy or scared to enter a room full of strangers. I am not suggesting that these behaviors are necessarily ones to be encouraged in all situations. But we do have much that we can learn from children in this regard.

I remember one time leading a preschool dance class on a theme of doing the laundry. Dirty clothes are limp; we can make ourselves limp. Washing machines shake the clothes around and then spin the water out; so we explored these two actions. We talked about two ways to get clothes dry — using dryers and hanging on a clothesline — and we explored suspending ourselves from two points and blowing in the wind. I had next intended to have the children fold themselves up, but one child, who was really transforming, called out, "No, you have to iron us." (This was clearly in pre-perma-press days!) But when I tried to have them stretch themselves to remove any wrinkles, the same child blurted out, "No, iron us by *touching* us!" How many of us can ask so clearly to have our needs met when we need a touch, a hug, some personal acknowledgment?

Sensory awareness is important not only for feeling, but for thinking. Movement and sensory awareness are the primary ways children learn about themselves and their world. Piaget (see Furth, 1970 and Wadsworth, 1971 for an accessible introduction) studied how children form symbols — and therefore language — by internalizing movement.

For example, children move up and down before they know these words. Next, the words become associated with the movement and the accompanying body sensations; young children cannot think or talk about movement without doing it. Gradually the words begin to stand for the movement; the need to do the full movement disappears, and the movement gets smaller and smaller until it is no longer physically demonstrated. It still exists inside, even though it may be reduced to only a slight degree of muscular tension, and although we are not always aware of it, we still use this internalized movement to think conceptually. Even Einstein (North, 1973) noted that he made his discoveries initially through visual and kinesthetic images of movement: he saw or felt an idea first, and the words came later.

In addition to this emphasis on the sensory-motor world, there are other ways we can recognize that young children inhabit a different reality. They see things that we do not, such as when my son told me what he saw at the fireworks: "The sky cracked open and spiders came out!" Their reality is often so strong that when we come upon children deeply involved in "imaginary play," we feel that we should knock to gain permission to enter.

Piaget (1929) described this reality as a state of primitive consciousness, in which children perceive inanimate objects as creatures with consciousness, participate in nature, and do not perceive the separations between things. They frequently transform their own identities. . . . How many times I have entered a preschool class only to have a child say "I'm not Jennie, I'm a cat today. Meow," ... or had a whole class turn into frogs right before my eyes, when I merely asked them if they could jump *like* a frog. A stick can become a horse, and they can become mommies or daddies or whatever they desire. When I took my preschool aged daughter to dance performances, she always picked out one dancer and said "I'm her."

Being told "how things really are" is irrelevant, as many memorable moments with young children have convinced me. . . . I remember the day my young son told me that when he grew up he was going to be a mommy and have a baby grow in his tummy. I told him gently that boys could not have babies grow inside their bodies, but they could become daddies, and daddies got to do great things too—like give baths to babies, and change their diapers, and play with them. . . . Ben chimed in "Yes! And I'll *dance* with my baby." While my dance educator heart was still warming over how successful I had been in teaching him, he continued, "And when I'm finished being a daddy, then I'll be a mommy and have a baby grow inside my body."

Piaget felt that such a primitive consciousness was the result of an inability to understand what really is happening in the world. He noted that a child's imaginative explanations decrease as the child gets older, in favor of "representational tools more adapted to the real world" (Piaget, 1929, pp. 130-131).

Yet it seems important to point out that, to the artist, the child's conception of the world is not something to be outgrown and discarded, but to be cherished and returned to on deeper levels. Artists often attempt to "tune into" a deep level of connection with nature. While the scientist "knows" that inanimate objects cannot speak, the artist may confront a twisted piece of wood, or a seashell, or a mountain, and open himself or herself to the "language it speaks." The dialogue that results may guide the creative process in the arts. The idea that one might communicate with an inanimate object is not part of the scientist's reality, but may be part of the child's and the artist's reality.

Piaget (1929) further notes that adults may return to more "primitive" states of consciousness in times of stress; the adult who bumps into a table may berate it as though it is a living being who intentionally inflicted pain. The artist may *choose* to return to such a state of consciousness, valuing it as a source of artistic and aesthetic experience.

The work of Hughes Mearns has further contributed to my own thinking about the reality inhabited by young children. His book *Creative Power* (1958) shares stories and thoughts from his work teaching creative writing to students. Mearns is concerned with what he calls the "native language of childhood." He writes,

> Most of the speech of children that we hear is not their own language but the imitative forms, thought and imagery of their elders. The adults that surround a young child go in eagerly for teaching their own speech; they ignore the native gift or drown it out with doggerel rhymes, set phrases, adult polite idiom, verses and prose made for children by adults. (p. 67)

Mearns notes that adults are standardized persons without the gift of language that marks one's own speech as unique, while children speak naturally in a voice we are accustomed to call poetry. Here is one of many examples from Mearns's book, spoken at bedtime by a young child to her mother, who was wise enough to record it:

> I have a secret from everybody in the world-full-of-people
> But I cannot always remember how it goes;
> It's a song
> For you, Mother,
> With a curl of cloud and a feather of blue
> And a mist
> Blowing along the sky.
> If I sing it some day under my voice,
> Will it make you happy? (p. 67)

And here is another example, this one a group project coming from a class of 3-5 year olds, following a dance session focusing on images of spring. I arranged the lines, but these were their words, inspired by the movement we had done:

> Crack! Crack!
> When the clouds get mad they hit together and the rain goes pitter patter
> And grass and flowers start popping up
> And trees blow in the wind.
> The birds come back and they find a place in a perfect pine,
> And the baby birds pop out of their eggs
> Crack! Crack! Crack!

Mearns speaks of this language as the voice of the inner spirit, and says that "To childhood the life within is one of the sure realities" (p. 65). This inner reality is essential to artists. As Martha Graham, the well-known American choreographer and dancer, has said, "The reality of the dance is its truth to our inner life" (Graham, 1979, p. 52).

An inner life, an alternate reality — these are different ways of describing something that often dies because we do not give time for it, or because we are told it doesn't exist.

How can we cultivate this other reality with preschool children? How can we let them know we value it, wish it to be part of our own lives—not to the exclusion of other realities, but along with them—so we can choose where we wish to live, so we can travel from inside to outside, from one reality to another? The arts offer one value for keeping alive this important part of the self. While there are many reasons I could give to justify dance in the early childhood curriculum, I think this is the most important one.

Dance for Young Children

Next I would like to discuss some ways that dance for young children may be presented so that it helps children gain access to an inner life and alternate realities. In my own teaching, it took me some time to recognize that even if children were enjoying moving and developing movement skills, I was still unsatisfied. I kept asking myself, "What is the difference between *movement* and *dance*?" Preschool children told me that the difference between dance and just moving around is that dance is *magic*. This description has been so meaningful to young children that I use it often — not in the sense of magic tricks, but as a magical state of being. Our magic comes from a quiet place deep inside us, and each of us possesses it. I sometimes use my geodes to explain this. On the outside, they look rather plain and quite similar. Inside each of them is something different and special, and we need it to make our movement turn into dance.

Preparing to dance means finding the "magic" inside each of us, often by sitting quietly for a few moments in a relaxed state. As we begin moving, we may explore doing simple movement, such as standing up and sitting down, first in an "everyday" way and then with our inside "magic." As the class continues, the emphasis is on inner sensation and allowing the movement to come from inside ourselves, rather than just imitating what is outside. Devoting their concentration to attending to their interior does indeed transform their movement, and transform themselves from "plain ordinary" children into dancers.

I also ask children to notice moments they experience outside the dance class that make them feel magical, and I encourage them to share these with me and with the other children. They have told me about finding an empty blue shell of a robin's egg lying on the grass, a dew-covered spider web in which there are rainbows, a moment just before falling asleep—feeling as "tired as wet butterfly wings." They have told me about waking up knowing it is your birthday, or waiting for Grandmother to come for a visit, or watching kittens be born. These are indeed magical moments, and it adds to my life as well as theirs to savor and appreciate them.

Once we have "gotten our magic" at the beginning of the class, we are ready to deal with the theme of the day. I try to choose themes that are in some way connected to the child's world, or a world they can enter readily. As an example, I would like to share with you an especially memorable unit I have done with young children on several occasions, that was initiated by my desire to correct the stereotype that most young children—and many adults—hold of Native American dance. I will tell you, like I tell the children, that I am not a Native American and I do not know their real dances, but I know that Native Americans dance about the spirits of things. While we cannot do these special dances, we can make our own dances about the spirits of things.

Prior to this, in earlier sessions, we usually have visited the worlds of other people, with trips to such places as backwards planets, jumping planets, and so forth. We have already discussed how important it is to be respectful of other people when you enter their territory, and what respect means. So we take time as we begin our class to find our magic and our respect, with a ceremony of the drum. I invite you now to share another reality with me as I tell you this story of time spent with young children. I tell them that fire was important to people who lived on this land, especially before heaters and stoves were invented. Some of the children have been on camping trips and have sat around a campfire. As they try to *tell* me about the fire, their bodies come alive, for words are not sufficient. . .. We are ready to dance.

We explore pointed shapes like flames, changing from one to another. I light some incense so they can watch the smoke drift and curl, and then we explore floating. We put the two parts together in alternation — the pointed shapes and the floating — and create the Dance of the Spirit of the Fire.

We talk of how important the sun is to all of us. We explore rising and sinking, slowly because the sun moves slowly. To make our own Sun Dance, we add a slow turn in between so we can let our own light shine on everything in the room. But young children can only move slowly for so long, so we try doing it fast. Wouldn't it be funny if the sun really went up and down fast? We laugh together as we think about a sun popping up like a jack-in-the-box.

We dance the Spirit of the Small Animals — taking tiny steps and then freezing, looking for danger. In dance terms this becomes a sequence — scurry, freeze, focus. I never ask them to pretend to be squirrels or rabbits. But the children feel their kinship with these creatures, and are transformed. The Dance of the Spirit of the Large Animals is similar, but we use galloping or leaping, feeling our weight as large powerful creatures.

We make other dances and have other ceremonies over the next several times we spend together. I bring in long strips of white cloth, and we have a banding ceremony as we receive our headbands. The headbands too become transformed — into streamers when we make our dance about the spirit of the wind; into a stream, giving us something to leap over. The headbands also turn into an art project, decorated with each child's own symbols to represent the spirit of the sun, the wind, the fire, the water.

As the unit develops over several days, we finally make a larger dance in several parts — the Dance of the Spirit of the Hunt. It includes stalking — with steps so silent it is as though our feet kiss the earth. Each child chooses whether to dance the Spirit of the Small Animals or the Spirit of the Large Animals. The section on the Spirit of the Bow and Arrow is probably their favorite. I bring in a real bow and arrow to show how a string gets pulled, bending it to get power to shoot the arrow. We bend different parts of ourselves, feeling the power in our muscles, and then shoot ourselves through space, landing as softly as an arrow.

Another section is a repetition of the dance of the fire; then we conclude with a ceremony of thanks . . .

> I'm thankful for the sky, and all that's in it (the sun, the wind, the clouds, the rain).
> I'm thankful for the earth, and all that grows in it and walks upon it.
> I'm thankful for my friends . . . to dance with.
> I'm thankful for myself.

We never performed these dances on a stage; they have never become polished products to be seen in a theater. Our only costumes have been our headbands, which some chose to wear as belts, when they were not being used as props. The only audience has been the class participants, which have on occasion included various adult groups, from university students to senior adults, dancing with the children; no one else has ever been invited just to watch.

As I think back over this and other dancing times I have had with preschoolers, I ask myself what the children learned. This is not a question I have always asked myself, any more than I asked myself what my own children learned from an outing to the zoo or a trip to see grandparents. But questions of accountability have taken on particular significance in today's world, in which there is so much to learn and too little time for learning it.

I certainly can make lists of vocabulary, concepts, and skills that children develop through dance classes; these become part of their total store of knowledge. But learning involves not just adding to a store of knowledge; it also involves discovering what is already there. Young children possess rich inner treasures, including the capacity to enter alternative realities — in which they may hear flowers growing, see spiders coming out of the sky, and become one with a small animal. Yet we all too often teach them that these treasures are mere childish things, to be tolerated and treated as cute, and only in those too young to do the real work that matters in the world. Then by the time children become adults, they no longer have access to their inner treasures, so dismiss them by saying, "I'm just not very creative."

Conclusions

I hope I have made it clear that I think reading and writing, critical thinking and computers, are all important; they were essential to me in writing this paper. But it is also important to find our own inner resources and dream of possibilities. As educators, we are faced with increasing demands to spend more time helping children develop new skills that they will need in the future. We must recognize, though, that we really do not know what the future holds; much of today's reality was only science fiction 20 years ago. To live in the future, our children will need all of their human capacities — not only to cope with what is, but to imagine what might be.

When I imagine "what might be" in the early childhood curriculum, it includes more time for all the arts, including dance. In my imaginary preschool, children are affirmed not only for what they are learning, but for who they are and what they already know; this is not just to build their self-esteem, but because teachers value children and the child within themselves. Further, teachers find many ways throughout the school day to encourage playing, exploring, and transforming, and to let children see that these activities are important for adults as well as children.

If I really allow my imagination to work, I can envision all levels of education supporting all of the capacities of all students, and acknowledging what young children (and theoretical physicists) know — that there is more than one kind of reality. Maybe if we can recognize that there are multiple realities, we will not have to dismiss or negate others who see the world differently than we do. And perhaps together we can create a reality in which we revere and respect all parts of ourselves and all others with whom we share the earth.

References

Furth, H.G. (1970). *Piaget for teachers*. Englewood Cliffs, NJ: Prentice-Hall.

Ghiselin, B. (1952). *The creative process*. Berkeley: University of California Press.

Graham, M. (1979). In J.M. Brown (Ed.), *The vision of modern dance* (pp. 50-53). Princeton: Princeton University Press.

Mearns, H. (1958). *Creative power*. New York: Dover.

North, M. (1973). *Movement education: Child development through motion*. New York: Dutton.

Piaget, J. (1929). *The child's conception of the world*. (J. & A. Tomlinson, Trans.). New York: Harcourt Brace.

Rugg, H. (1963). *Imagination*. New York: Harper and Row.

EDUCATIONAL GYMNASTICS
Meeting Physical Education Goals

A well-planned educational gymnastics program contributes to the total development of the child. Gymnastics builds increasingly complex body management and control skills that are the bases for later skill learning.

Susan Capel

Gymnastics provides opportunities for inventiveness, creativity, challenge, and adventure. Gymnastics can be described as activities which result from performers testing their ability to control body movements in relation to the force of gravity in deliberately selected circumstances. Gymnastics makes several distinctive contributions to the education of elementary-age students. The structure of gymnastics builds increasingly complex body management and control which are the basis for later skill learning. Gymnastics also makes demands on strength, stamina, and flexibility. Strength, speed, agility, and the ability to maintain a satisfactory relationship between the different parts of the body are essential to successful performance. These help develop the overall physical capacity of children at this crucial stage.

Olympic and educational gymnastics are the two types currently taught. They have similar content, but differ in their philosophy, aims, objectives, and teaching methods.

The similarities include the mechanical and anatomical actions of the basic gymnastics movements, which are travel, balance, fall, and flight. In both types of gymnastics these are incorporated into sequences which have both logical structure and aesthetic appeal.

The differences between the two are as follows: Olympic gymnastics is essentially competitive and is judged by set criteria. The aim is to win, and objectives are related to sequences which include sport-specific skills and actions. The aims of educational gymnastics include: developing the body's efficiency and skilled use in practical situations when working alone and with others, on the floor and on the apparatus, and stimulating an understanding and appreciation of objective movement, coupled with an ability to invent and select appropriate actions. Thus the dual aims of experience and practical skill application in problem-solving situations and knowledge about the activity are apparent and important. Olympic gymnastics develops depth within a narrow range; educational gymnastics stresses a broad range of activities, then gradually selects, arranges, and refines them.

In elementary school, educational gymnastics has more to offer to a greater range of students than Olympic gymnastics. It aims to (1) develop the latent movement powers, (2) produce good movers, and (3) in-

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crease body awareness, body concept, movement concepts, and skill. These goals can be accomplished by exposing children to a wide range of movement experiences, developing an understanding of gymnastics for its many purposes, and appreciating the aesthetics of excellence in body movement. The guided-discovery, self-selection, and problem-solving approach to the teaching of educational gymnastics is ideally suited to achieving this end. On the other hand, the teaching of Olympic gymnastics generally emphasizes externally imposed movements which are practiced until the student reaches as near perfection as possible. This article is directed toward teaching educational gymnastics in the elementary school.

The development of themes

Teaching educational gymnastics is accomplished through the development of themes. The aim of a theme is to bring about certain changes in the students' behavior and understanding. A theme emphasizes a particular aspect of movement which provides a focal point on which to build a series of lessons. Although a wide range of bodily tasks and activities are undertaken within a particular theme, only one aspect is emphasized. The objective is to produce a final piece of work within the theme's framework. The chosen theme is gradually developed through a sequential series of movement experiences. Specific tasks are set, from which students choose movements and structure their own sequences to achieve these objectives. These sequences include individual floor sequences, individual sequences on the floor and mats, partner sequences, and sequences on large apparatus.

In order to build a sequence children need to (1) explore different movements within the set problem, (2) identify what has been explored, (3) select certain movements, (4) link the movements together, (5) identify a start and end for the sequence, then (6) refine the sequence to improve the aesthetic appeal. Thus, each movement within the sequence forms a phrase incorporating preparation, climax, and recovery. By linking several of these phrases together in a continuous movement flow the movement sequence (or sentence) is produced.

Categorizing themes for different age levels

Often, themes are categorized according to the age group or movement abilities for which they are designed. With very young children, movement themes should evolve from the "natural" movements they use. These themes focus on gross body actions, enabling children to become more aware of the maneuverability, flexibility, size, and shape of the body. These actions include running, jumping, swerving, tumbling, and falling. After competency and fluency of these actions have been accomplished, themes emphasizing separate body parts should be introduced, which are themes on balance, flight, shape, or partner work. As children gain greater control and understanding of their movements, themes emphasizing space, time (speed), flow, accent, and tension (i.e., the dynamics of movement) can be developed. These themes focus on using the optimal amount of energy in relation to body shape and weight for any given task. The relationship of the body to other people and to equipment should then become the emphasis for additional themes. Table 1 shows specific themes which can be included within these major themes.

Table 1. Themes concerned with the general themes of gross body actions, particular body parts, spatial and dynamic aspects, and relationships

Gross Body Actions
    Travelling and stopping
    Weight bearing
    Transference of weight
    Flight
    Body shape
    Twisting and turning
    Rising and falling
    Swinging
    On- and off-balance

Particular Body Parts
    Use of hands and arms
    Use of legs and feet
    Emphasis on body surfaces (e.g. rolling, falling, recovery)
    Relationship of hands and feet to each other
    Symmetry and asymmetry

Spatial and Dynamic Aspects
    Levels and directions
    Changes of speed
    Tension and release
    Rhythmic patterns
    Spatial patterns in movement and on apparatus

Relationships (including assisted flight and recovery, assisted balance, taking part or whole weight, lifting, carrying, and placing)
    Partner work
    Work in threes
    Group work

Other ways themes can be grouped are:

- introductory themes, which include locomotion (traveling and stopping), weight-bearing, transference of weight, use of legs and feet, and changes of speed
- intermediate themes, including use of body surfaces (e.g., rolling), flight, on- and off-balance twisting and turning, rising and falling, use of hands and arms, body shape, levels and directions, partner work
- advanced themes including swinging, symmetry and asymmetry, relationship of hands and feet, rhythmic patterns, tension and release, work in small and large groups.

The themes in the *introductory* group are action or dynamic themes. They include actions basic to all movement, which lead to body control. These actions are essential to the development of all subsequent movements. The *intermediate* themes refine and clarify actions and introduce more challenging work while concentrating on different body parts. Bodily movement is further refined, and both physical and aesthetic demands are emphasized by the themes in the *advanced* group.

Age, experience, or intelligence of the class cannot be the sole determinant for selecting a theme for that class. Each child, class, and teacher are different, the needs of children change at different times, space and equipment vary, and the ideology of schools and departments are different. Selection of themes and order of work should be based on the interaction of all these factors. Thus, flexibility in the teaching situation is essential. The first lessons with a class should be of a general nature to assess the needs of the class and therefore determine the initial theme to be developed.

Suggested themes for different grade levels

Some suggestions for themes and activities are presented here. Although suggested age groups are given for each theme, order and speed of presentation may vary. Some of the teaching could be direct instruction, but for the most part children will be allowed to experiment because there are numerous ways to accomplish any task. (See Table 2 for list of skill themes to be used in movement education lessons with elementary age children.)

Preschool and kindergarten

Traveling is often the first theme presented to a preschool or kindergarten group (total of 12 lessons). This could be introduced in the first lesson by emphasizing traveling on the feet using space (e.g., walking, then walking backwards and sideways). This could be followed by running in place, running anywhere in the gym, bouncing in place with feet together, then moving while bouncing. Running and bouncing around hoops or in and out of hoops could then be used during the floorwork part of this lesson.

The second and third lessons on traveling would also emphasize traveling on the feet. The warm-ups could include running without touching others, keeping a space around oneself, bouncing anywhere, bouncing, then crouching low and springing like a jack-in-the-box. Floorwork would develop walking, running, bouncing, hopping, skipping, jumping, and galloping activities in forward, sideways, and backwards directions. Apparatus work includes these actions, allowing the children to experiment with different ways of traveling along the apparatus using the feet. Activities

Table 2. Skill Themes Which Could be Used in Movement Education Lessons with Elementary Age Children

Locomotor**	Non-locomotor**	Manipulative
Walking	Turning	Throwing
Running	Twisting	Catching and Collecting
Hopping	Rolling	Kicking
Skipping	Balancing	Punting
Galloping	Transferring Weight	Dribbling
Chasing	Jumping and Landing	Volleying
Fleeing	Stretching	Striking with Rackets
Dodging	Curling	Striking with long-handled implements

**Suitable for use in dance, gymnastics and games activities

*Suitable for use in games activities only included in the following lessons build on these initial lessons, and may focus on traveling on the feet and hands (two lessons), rolling (four lessons), and linking movements (three lessons).

A second theme may be weight-bearing and the transference of weight (total of eight lessons). This involves taking weight on large parts of the body (one lesson) and on small parts of the body (one lesson). The lesson focusing on large parts of the body may start with walking, advance to running, then use another action to go anywhere in the gym. The children should be encouraged to use as much floor space as possible, but keep as far away as possible from everyone else.

Floorwork could include experimenting with taking weight on large parts of the body (the buttocks, back, stomach, shoulders, sides, and chest) using some small parts of the body when necessary (hands, feet, knees, head, and one shoulder). Apparatus work may include traveling on the floor, onto and then along the apparatus, and back onto the floor using large parts of the body to take weight. Children should not be allowed to jump, because this does not use large parts of the body. The children should try this task again using one part of the body not used before.

It is hard to achieve meaningful gymnastics movements using only large or small parts of the body. Only one lesson is spent focusing on these two areas separately, then the following lessons could focus on both large and small areas in contact (one lesson), hands and feet (one lesson), rolling (one lesson), rocking and rolling (one lesson), and jumping (two lessons).

First and second grades

Lessons for first and second grades may focus on a theme involving flight (total of ten lessons). This could initially focus on take-off and landing (one lesson). This work could be introduced by having the children run and stop on command, then run and jump as high as possible.

Floorwork would further develop this. First, the children could bounce in place (experiencing flight by taking off from two feet and landing on two feet). Gradually, they could be encouraged to jump higher, then run, jump, and land on two feet. The flight would now be taking off from one foot and landing on two feet. A sequence to develop this may include run, jump, land; then take off in another direction, run, jump, land. Emphasis could then be put on type of jump: e.g., (1) run, jump from one foot and land on the other, (2) run, jump from one foot and land on the same foot (hopping), and (3) jump from two feet and land on one foot.

Throughout this work the teacher should stress bending the knees prior to take-off and on landing, arms swinging up in the air to aid the jump, bending the take-off foot prior to leaping, and lifting the upper body as high as possible in the flight. The apparatus used in this lesson may be only benches. Activities may include stepping onto the benches, then jumping off the benches with two feet, landing on two feet, jumping over the bench from one foot, and experimenting with other types of jumps.

To develop this theme further, the next four lessons could stress body shape in flight. Wide and narrow shapes should be emphasized first. Initially the apparatus may consist only of mats, with the children jumping onto, off of and over the mats. Practice of rolling after landing may be very useful at this stage. Tucked jumps may then be introduced, followed by the use of hands to help the flight, both from the floor (e.g., bunny jumps) and from the apparatus. Turning in flight (three lessons) would be emphasized next. Jumping with quarter turns (and rolling when landing) would gradually lead into half-turns. Sequences on both the floor and the apparatus, consisting of three jumps with quarter- or half-turns, may finish this series of four lessons. A final emphasis within the theme of flight could be flight onto and off of the apparatus. The final sequence of the flight theme may incorporate movement on the floor, then flight onto and off of the apparatus, using different body shapes and different types of jumps.

A theme concentrating on body shape (total of eight lessons) could then be introduced. This could incorporate stretching away from the center of the body (one lesson) while jumping and traveling. Stretching away from the center of the body using different body parts for support, i.e., balancing (two lessons), could be emphasized next. This phase of the theme could be introduced by having the children make a stretched shape with hands and feet on the floor, then reduce this support to three points of contact with the floor, followed by two points of contact. Running, then leaping showing a wide or a narrow stretched shape, then slowly lowering into a three point wide or narrow shape and holding could then be introduced. Apparatus work may incorporate traveling in a wide or narrow shape, jumping onto and off of the apparatus, and balancing on two or three points in a stretched shape. Lessons on curling toward the center of the body (one lesson), twisting (one lesson), and an introduction to symmetry and asymmetry (two lessons) could follow.

Third and fourth grades

Directions (total of eight lessons) may be the focus of a theme with third and fourth grade students. This may include work on changes of direction and traveling (two lessons). Apparatus work may emphasize approaching from one direction, moving along the apparatus, and leaving in another direction. Work on changes of direction and rolling (two lessons), then changes of direction emphasizing linking themes (two lessons) could be culminated with sequences on both the floor and apparatus which include a jump, a roll, a balance, and taking weight on the hands and feet. Twisting (two lessons) could be the last area of emphasis within a theme on directions, culminating in sequences on both floor and apparatus which include any order of a twist, a turn, a jump, and a roll.

Changes of speed (total of ten lessons) may be another theme emphasized with third and fourth graders. This could include travelling (two lessons), receiving body weight (one lesson), supporting weight (one lesson), balance (one lesson), flight (two lessons), and body shape (one lesson). Some of the floorwork within this theme may include (1) crouching, then falling slowly forward onto hands and springing feet up to them, (2) pouncing onto hands with feet following quickly, repeated with increasing the distance pounced, (3) rolling, (4) other movements, both stretched out and curled up, and (5) emphasizing greater speed in curled up movements.

Fifth and sixth grades

Fifth and sixth grade students could focus on linking themes (total of eight lessons) of weight bearing, transferring weight and directions (one lesson), transferring weight and balance (one lesson), flight and balance (one lesson), flight and shape (one lesson), twisting (one lesson), twisting and turning (one lesson), and twisting and turning with changes of speed (one lesson). These would involve refining both movements themselves and the quality of the sequences developed by the students.

A final lesson within this theme may start with a warm-up in which the children walk anywhere in the gym, gradually increasing and decreasing speed, then changing directions. Emphasis on a clear contrast between fast and slow walking is important here, and children should be encouraged to change direction and speed frequently in "short bursts."

Floorwork may produce a sequence consisting of a balance on two hands and one foot then, with the free leg leading, twisting around to balance on one hand and two feet facing the other direction, slowly lowering onto the buttocks, tucking up the legs and spinning. Emphasis would be on a stretched starting position, toes pointed, good body line, a slow, controlled movement, body tucked in the spin (knees to chest) to increase speed and hands used to push off.

A repeat of the sequence with legs straight and stretched above the floor in the spin would emphasize how changing shape can be used to slow down a spin. A third repeat would emphasize starting the spin with legs straight, gradually bringing knees to chest to increase speed, while spinning. Awareness of the greater body tension required to do this can be stressed. The apparatus work may include a sequence which consists of a balance on small parts of the body and a variety of twists and turns, with the emphasis on changes of speed.

A theme involving partner work could also be introduced to fifth and sixth grade students (total of eight lessons). This may include work on any of the previous seven themes from traveling to linking, but emphasizes work with a partner rather than developing the theme itself.

The initial work could involve one person following the other, emphasizing the pathway only (two lessons). This is developed into leading and following (one lesson) with both people using the same movement (e.g., a sequence involving a jump, a roll, and not more than two other movements developed by each person). The first person would show his or her sequence to a partner who copies it, then the second person would show his or her sequence to be copied.

Matching (two lessons) may include a sequence where the students work together side-by-side facing the same direction to do a jump, a roll, and a balance, in any order. Coming together and going apart (two lessons) and moving over and under each other (one lesson) may complete this work on this theme.

Table 3. Gymnastics Themes Designated by Grade Levels

Preschool/Kindergarten	Grades 1-2	Grades 3-4	Grades 5-6
Traveling	Flight	Directions	Linking themes
Weight-bearing and Transference of weight	Body shape	Changes of speed	Partner work

Summary

To summarize, the suggested themes for each grade level are shown in Table 3. Themes progress from introductory to advanced as students develop and refine their skills. Some of these themes can tolerate longer treatment than others due to their content and class needs. The themes need not necessarily be presented in the order outlined here, or just to the age groups suggested.

Educational gymnastics is an ideal medium through which the goals and objectives of physical education in the elementary school may be achieved. A well-planned educational gymnastics program contributes not only to motor skill development but also to the total development of the child. Children should not be deprived of these developmental opportunities.

Gymnastics, in conjunction with rhythmic and creative movement and games and sports skills, provides a well-balanced program for children in the elementary school. The movement education approach to teaching these activities allows them to be integrated into a meaningful, comprehensive curriculum, contributing to the goals and objectives of education as a whole.

Bibliography

Brand, J. (Ed.). (1983). *Junior gymnastics*. London, England: Inner London Education Authority.

Graham, G., Holt-Hale, S., McEwen, T., & Parker, M. (1980). *Children moving: A reflective approach to teaching physical education*. Palo Alto, CA: Mayfield Publishing Co.

Mauldon, E., & Layson, J. (1971). *Teaching gymnastics*. London, England: MacDonald and Evans Ltd.

Morrison, R. (1969). *A movement approach to educational gymnastics*. London, England: J. M. Dent and Sons, Ltd.

Stanley, S. (1969). *Physical education: A movement orientation*. Montreal: McGraw-Hill Co. of Canada Ltd.

Williams, J. (1979). *Themes for educational gymnastics*. London, England: Henry Kimpton Ltd.

To Arouse an Interest

Sally A. Parent

How does one begin to express, to a reading audience, a feeling or a knowing from within one's self, a feeling that is personal, which needs mutual respect from both the writer and the reader in order for both to respond in ways essential in any human relationship? It is easy to sparkle with people who share similar beliefs but I want to arouse an interest among a more divergent audience. I'm terribly perplexed by the dilemma in which I find myself, interested in communicating with people with variety in their point of view but not anxious to develop a passionate controversy. My desire is to take this opportunity to respond to an insight or an understanding of the reader's thinking. Through being familiar with some of the views of you readers and instinctively trusting you as leaders and educators, I will proceed in faith, with an inner confidence in you, that you will listen with an openness to the feelings/knowings I want to share about educational gymnastics.

First, all forms of gymnastics can be educational; for this article the prefix is taken from the British meaning "school work." School work reflects educational goals that are similar to all subject areas where the focal point is shared between the learner and the subject and the concern is placed on giving learners rich experiences and activities to help them develop to their fullest potential. In educational gymnastics "perfection of the individual's performance is paramount—excellence is demanded within the choice, range, and ability of each individual. Theoretically, each person, whatever his size, shape, flexibility or strength can achieve perfection."[1] Great emphasis is placed on the learners' knowledge and awareness of what they are doing. Skilled performance is an intelligent activity in which thought and purposeful understanding are inseparable.

I use the word "educational" for the thoughts I wish to convey and the experiences I try to provide reflect the teaching/learning of gymnastics in an educational environment. I use "educational" because I must be devoted to the skilled, the unskilled, the motivated, the unmotivated, the "pro" and "often cast out" alike with the same commitment, the same challenge, the same goal—to educate to the fullest. In no other discipline is the emphasis on control of body weight so necessary, where students gain in their ability to meet the challenge of gravity and other forces while balancing, traveling, or in flight.

Gymnastics is perhaps the most flexible of all subjects of the physical education curriculum, readily adaptable to the needs of a particular group and enabling each generation to provide emphasis and interpretation related to current attitudes and theories.[2]

Borrowing the title from Ruth Foster's book, *Knowing in My Bones*,[3] best describes the way I feel about teaching educational gymnastics. I love gymnastics for I can observe the growth and learning processes that develop from taking chances, chances that must be taken by the teacher and learner alike—chances that are taken through thoughtful preparation by a five-year-old or a twenty-year-old, demonstrating that they understand what their body is capable of doing and that their teachers have helped them select and perfect through many preparatory tasks. It's exciting to watch learners being on their own, free to make some of their movement choices, seeing self-confidence and self-motivation demonstrated before your eyes, and knowing you have helped to cause this to happen.

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The encouragement and the teaching for inventiveness on the part of the learner is fostered in educational gymnastics where one takes an idea, initiated by the teacher or the learner, and develops one's own end product. This approach seems to take on more meaning and learning than for the student who usually must practice and perfect what someone else has planned.

In every creative process, a trial of strength takes place between the person and the materials, each attempting to impose its will on the other. This also happens with the individuals and their bodies as they work through inventive gymnastics actions on the floor or on apparatus.

The body is stubborn, perverse, like a puzzle that doesn't want to be solved until the learner imposes meaning, control, and discipline and brings understanding to it. Only when the learners are stronger than their material does the concealed truth become clear. For the teacher, guiding the learners through this creative process, a prideful moment is shared.

Well-skilled, natural movers will catch any teacher's attention and pride will be shared in their work, but that feeling of pride will be multiplied when lesser skilled or more poorly motivated students demonstrate feats with body tension from their nose to their toes and with all their classmates sharing in their accomplishments. Teachers must be able to relate materials and feedback to the potential of each child.

Teachers of "movement education" and "educational gymnastics" have been accused, often rightly so, of frequently lacking substance and direction in their teaching. Sometimes we get caught up in making our movement tasks so open to include everyone or keeping the students at the experimentation or exploration stage so long that we lose focus on what we are teaching and fail to challenge more specific learning.

Turning On the Learners

We teachers need to do something that will turn learners on, not just the well skilled, so that all may reap the benefits of gymnastic learning during the formative years. The children who are not the super stars in performance may be the super teachers, super coaches, and super people because they have had to try harder to think more intensely on what their body is doing or what they wanted it to do. For them, the process of learning is much slower; they do not skip steps; responses do not come naturally. These children can be encouraged to love small successes if teachers share with them in the recognition they deserve. Teachers will have come closer to reaching a major educational goal, will have helped each learner to recognize and reach his/her highest potential.

Are teachers, physical educators, not to be compared with scientists? Should we not be continually experiencing, doing, exploring, undergoing, traveling, and finding ways wherein the body can move efficiently and effectively in planned and unplanned settings? Are we content to have a single way, a "proper way," a "correct way," and not allow for versatility and change? The only thing that is "right" or "proper" about a way to move is in relation to the mechanical laws of the universe and how the build and makeup of a single person adapts the body to a movement task.

Developing the "Spirit"

But just to arouse interest, to explore, to experience is not enough to describe or challenge the total process of learning. We must be selective in the materials we choose and the content around which we develop experiences so that the value of the product is not diminished. Teachers must be thoroughly versed in the content to be taught. I feel that we in physical education have been too complacent in assuming that anyone can teach physical education in the elementary school. Certainly some teachers are capable of "training" a group of children to perform a forward roll, a headstand, a cartwheel, etc. These have been described, outlined, talked about in numerous professional books; anyone can follow the steps and "zip," they are teaching gymnastics.

We need to get involved in educating specialists who love children, who love to share their successes and failures—specialists who know movement, who know gymnastics, its limitless movement possibilities, its satisfaction in giving challenging, daring adventure, in discovering the human body's potential. This is the kind of specialist who will personalize/humanize the learning and develop the "spirit" or "feeling" that will help to make learners free in their gymnastic movement.

There is no way that this "spirit" or "feeling" can be developed through rote memorization. A horse learns through continual repetition of a task, by being given signals from its trainer through the senses of hearing and touch and sometimes through taste for positive reinforcement. Depending on the animal and on the trainer the degrees in training differ. A "dumb" horse has to repeat more often, is touched more severely, reprimanded more frequently, and more infrequently is rewarded with a loving pat or an apple.

I have seen, all too frequently, this method used on humans. The horse on the intelligence scale for mammals ranks near the very bottom, Homo sapiens at the very top. The "spirit" or "feeling" that I love to see in horses and in children can be killed because of pressure from the teacher and the methodology that is used. I also see the results. I see learners giving up and dropping out of physical education programs. It is not the content that causes the giving up attitude; it more frequently is what we do with the content, how we teach.

If my job depended on my turning out a learner who had to be able to perform a prescribed set of gymnastic actions within a set time period then I would approach the role of teaching much differently. Since we have been given the responsibility because of our experience and background, to stimulate the thought processes of our learners through our content in physical education, we must not have narrow aims like those associated with training; we must activate the mind and encourage the learner to inquire into the subject of gymnastics. Marie Riley suggested that we must "create alternative approaches to skill development that are consistent with the characteristics of children, the principles of learning, and the goals of physical education."[4] We must subdue desire for self-aggrandizement in favor of seeing the learners assume a greater role in their learning.

Content is important regardless of the teaching style that is presented. The teachers must know where they are going with every lesson (with every learning experience) to assure that learnings are taking place. In an area as functional as gymnastics the teacher must know all the movement possibilities within gymnastics, know a suitable progression to promote growth, and most importantly know children and be able to observe, analyze, and provide meaningful feedback to challenge and to promote continual progress.[5]

Giving Direction to the Content of Gymnastics

The following eight themes are included to give direction to the content of gymnastics. Understanding of the use of these themes is necessary in order to develop logical progression. Kate Barrett has briefly described themes as they relate to organizing content in games,[6] and there are several similarities. For a more complete discussion the reader should refer to *Physical Education for Children: A Focus on the Teaching Learning Process*, where with great sensitivity to the work of Laban, Barrett developed dance content around seven themes, game content around nine themes, and Logsdon developed gymnastic content around the following eight themes.

Theme 1. Awareness of the Body (with emphasis on the ways the body can move)—Creates environments, where children are encouraged to try, discover, invent, see, learn, and in general begin to develop a movement vocabulary appropriate to gymnastics.

Theme 2. Awareness of Space (with emphasis on areas, levels, directions, extensions, and pathways)—Focuses on using space and developing an awareness of where the body is in space is it moves.

Theme 3. Awareness of Time (with emphasis on body actions and activities)—Concentrates work on how the body moves, with specific attention to the time factor and to improve the efficiency of movement by creating experiences that involve the production and regulation of speed.

Theme 4. Awareness of Relationships (with emphasis on body shapes and actions of the body)—Concentrates on the thoughts, actions, and feelings of the mover on producing, maintaining, or avoiding specific relationships with body parts, one body part to another, or total body with apparatus.

Theme 5. Awareness of Weight (with emphasis on activities of the body)—Focuses on the ability to produce, select, and regulate strength and energy resulting from varying the amount of muscle tension.

Theme 6. Awareness of Flow and Continuity (with emphasis on selection and refinement of movement in sequence)—Focuses on improving the totality of the movement response—the movements themselves and the way they are linked.

Theme 7. Awareness of Relationship to Others (with emphasis on partner and small group work)—Focuses on combining and sharing actions with others.

Theme 8. Awareness of Rhythm (with emphasis on creating, repeating, and refining rhythm patterns in movement sequences)—Refocuses attention on the totality of movement, to develop a feel for the rhythm that can exist in gymnastic movement.

Each theme is not taught in its entirety and exclusive of any other theme to any one class. The themes are placed on a spiraling curriculum, each to be revisited, some many times, each time being approached in a more difficult environment or sophisticated way. Themes are also to be combined with each other for more complex learnings. Through the use of the themes in organizing gymnastic content, the learner is encouraged to become more capable in adapting learnings to new situations.

In earlier years (age 5-7 years) an area of content in Theme 1 may be traveling and balancing emphasizing use of hands. The concept of "weight on hands" would be examined through movement tasks that would excite the learners to discover what they could accomplish with the hands providing the base of support for the total body weight for differing time intervals. At a later stage of development (age 9-10 years) the child en may be working on Theme 6, linking actions using hands and/or feet with rolling actions, adapting earlier learnings to a different focus.

The Search for Better Ways to Relate to Learners

The children will need the guidance and expertise of the teacher to create the environment, to analyze the responses, and to help each learner reach their potential and feel successful. Innumerable personal responses are possible within this unit focus, including known movements but not limited to specific actions such as a handstand lowering into a forward roll; backward roll into a back extension; round-off into a backward roll, where the ability to support weight with the hands and arms is a necessary understanding. The completeness of the action and the linking of the two actions would be the focal point; however, the ways in which the body moves—its parts and as a whole—are always in the teaching toward a quality response.

The goal of educational gymnastics is to provide all learners every opportunity to reach their potential in gymnastics so that they appreciate gymnastic movement and find success in their performance without sacrificing the preparation for successful participation in Olympic gymnastics if they desire to do so.

I have been guilty of late in feeling that what I am doing is great and I am receiving personal satisfaction in what I am observing in the elementary school children in their gymnastics lessons and in my college students as they begin teaching educational gymnastics. Now is the time to find still a better way to relate educational gymnastics material to learners. Those of us in teacher preparation must be planning for the future, as are our fellow scientists. We must continually activate our minds to keep the process going to search for greater meaning. Join me.

Endnotes

1. Williams, Jean. The importance of gymnastics for individual development. In *Focus on gymnastics*, published by Association of Principals of Women's Colleges of Physical Education Conferences, Eastbourne, East Sussex, England, 1975/76.
2. Bambra, Audrey. Editorial Comment, in *Focus on Gymnastics*, op. cit.
3. Foster, Ruth. *Knowing in my bones*. London: Adams and Charles Block, 1976.
4. Riley, Marie. Teaching original games. *Journal of Physical Education and Recreation*, September 1977, pp. 30-32.
5. Department of Education and Science. Movement-Physicaleducation in the primary school. Westerham, Kent, Her Majesty's Stationery Office, 1972.
6. Barrett, Kate. Games teaching: Adaptable skills, versatile players. *Journal of Physical Education and Recreation*, September 1977, pp. 21-24.
7. Logsdon, B.J., Barrett, K.R., et al. *Physical education for children: A focus on the teaching process*. Philadelphia: Lea and Febiger, 1977.

More Than Simply Movement Experience

The process that produces an educational gymnastics sequence moves from exploration, selection and rejection, modification, repetition, and refinement to mastery learning. All stages are valuable and require equal attention.

Joy Standeven

Much educational theory today is concerned with knowing as a process, with "learning by experience," and more recently with "learning by discovery." The emphasis has changed from the importance of the product, in the more traditional style of teaching and learning, to emphasis on the learning process itself. Is experience alone educational? No, not if we accept that education should be meaningful and valuable to the learner. Not all experiences will be of equal value.

The structure of the learning experience may, or may not, produce an increase in skill or understanding, but it will cause the development of positive and negative attitudes toward the experience itself. If, as a result of a boring or unrewarding experience, an individual develops a negative attitude, it is questionable whether the process has been of educational value. The learning process and the end product should be closely interrelated and need to produce positive attitudes as well as skill and understanding.

Educational gymnastics has been criticized on the grounds that it simply provides experience, or emphasizes the process of learning, and in the hands of some teachers has made little or no contribution toward increasing skill or even versatility in movement. Early writers in the area were aware of the danger of stressing variety for variety's sake and underplaying the development of skillful movement.[1]

Simply to "find another way" of moving is by no means necessarily educational, nor is it the purpose of educational gymnastics. To develop an individual's movement response over a broad area is, however, one intention. As Williams puts it, "(The teacher) wants them to search out and range over every possible connection and tributary of the theme before the territory can be thoroughly known."[2]

To utilize inventiveness is a characteristic of the content of educational gymnastics—but inventiveness within certain parameters. McFee[3] has shown that to speak simply of *movement* as the medium of gymnastics is incomplete; not *any* movement, even if it is invented by the learner, is acceptable.

For example, to crawl along the floor on elbows and knees in response to a task requiring the learner to travel on different body parts is not only uncomfortable, possibly damaging to body tissues, but is neither necessarily skilled nor gymnastic. What is appropriate gymnastic movement is determined, at least in part, by

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"reference to what has gone before in gymnastics—that is, to gymnastic practice."[4]

This does not preclude the use of new and different criteria in the determination of what is gymnastic movement, for "the work of the revolutionary, too, is rendered intelligible by reference to what has happened before, against which it is a reaction." The concept of gymnastics, according to Carroll,[5] is in need of clarification. What is, and what is not, gymnastic movement may be determined more by the context within which it takes place than by the movement itself, according to McFee. For example, in one context a cartwheel may be a piece of dance, while in another it is a piece of gymnastics.

To justify gymnastics in the school curriculum it is necessary to show that it contributes something which is not provided by any other curricular subject. In my view, gymnastics deserves a place because it has a unique role to play. Its central concern is to focus attention on the body in developing physical skill, not in order to beat an opponent, or to communicate anything, but learning to manipulate the body on different surfaces, through spaces and over obstacles for the sheer sake of bodily skill itself. As Williams puts it: "Perfection in bodily skill is demanded for its own intrinsic value."[6] And Wright states: "For me, the ultimate justification for educational gymnastics continuing to grow, develop, and flourish must lie in its capacity to grip some people with the desire to pursue their own creation/composition/performances as ends in themselves for no other reason than to 'get them right' as experiences of delight in and for themselves."[7]

The process which produces an educational gymnastics sequence is concerned with exploration, selection and rejection, modification, repetition, and refinement to mastery learning. These processes are not determined by random options on the part of the student, but involve knowledgeable decision making. No part of the learning process is any more or less valuable than any other part; all require equal attention.

The experimental stage allows individuals maximum freedom within the set task to discover for themselves the full potential of the movement concept. At this stage, the teacher will encourage the student to find many different answers to a problem. Some learners will be pleased to receive ideas from each other, or the teacher, quite soon; others will not want suggestions for quite some time; some individuals prefer to be left alone with their problem. It is important for the teacher to know the class in order to choose the appropriate moment to step in with suggestions either to individuals or to the class as a whole. However unimaginative a class may seem to be, this stage of learning should not be short-circuited, for without it the movement vocabulary is likely to be impoverished and stereotyped. Unfortunately for some teachers, this aspect has been overemphasized and instead of being the first stage of the process it has become the only stage.

Selection and rejection require learners to make decisions relative to their individual capabilities and the task in hand. Some children require guidance from the teacher to clarify the criteria on which their decisions should be based, or they may need encouragement to challenge themselves more. As the learning process develops, attention is focused toward the performance of a phrase or sequence of gymnastic actions put together to form a logical composition. At this stage repetition is the main characteristic, with modifications being made which lead to refinement of gymnastic movement.

The last stage—mastery learning—is a concept needing emphasis. Sadly, it is too often neglected or rushed through in educational gymnastics leading to frustration for the learner, a sense of lack of achievement, and no end product.

Changing Teaching Methods To Achieve Progression

Progression through these stages of learning may be brought about by a constant and subtle changing of teaching methods which may best be seen as arranged on a continuum with three specified types of methodology dependent on the amount of decision making permitted to the individual. Where the teacher makes all the decisions, the task will be directed leaving no choice to the learner. At the other end of the scale, the indirect method is concerned with extracting ideas from the child, the individual responding in almost any way he/she chooses. Between these two poles is a broad area which permits the individual to make decisions within the limitations already chosen by the teacher. The degree of limitation may be broad or narrow.

For example, a task allowing many decisions to be made by the individual could be: "Travel over this piece of apparatus first forwards, then backwards, and finally sideways."

A task still allowing choice but confined within narrower limits might be: "Taking your weight on your hands, show first a curled and then a stretched shape."

It is probably only rarely that either of the two extreme ends of the continuum will be used. The skilled teacher, by varying the degree of limitation and thus the amount of decision making involved, will enable the children to progress through the different stages of learning. This is shown on the chart on page 130.

The following two sample learning experiences show how this process might be used.

Theme: Traveling

Task 1: Find ways of traveling about the space.

Task 2. The teacher will make various suggestions such as find ways of: traveling close to the floor, springy ways of traveling on the feet, using hands and feet, etc.

Task 3. Introduce the idea of taking the legs over while the body weight is supported only on hands.

Task 4. Support body first by one hand and then the other, while the legs wheel over the hands (cartwheel).

Task 5. Can you use either hand first, twist into or out of the move, slow it down, speed it up, make it your own in some way?

Theme: Changes of speed

Task 1. Cross the mat at different speeds.

Task 2. Find quick and slow ways of crossing the mat; utilize the different body parts, different actions. Try varying the speed within the actions.

Task 3. Try speeding up the approach, controlling movement across the mat and slowing down to stop.

Task 4. Use an accelerating run up, launch the body into the air, land lightly and arrest momentum.

Task 5. Accelerate into a powerful movement and control the recovery.

By judicious use of the different methodologies, the learner is enabled to progress from the stage of exploratory learning to the stage of mastery so that experience aids both versatility and skillfulness in gymnastics.

The teaching process may be exploited as a scheme for the development of a whole theme, and the pattern shown might represent progress over a number of lessons. The scheme may also be utilized within a single lesson, so that the overall progression and development of a theme might be achieved by working through the process a number of times. The same kind of task progression can be applied in order to develop specific skills which are considered appropriate to the whole class, such as forward and backward rolls, specific jumps, and balances (e.g., handstands, cartwheels), or alternatively, and equally as important, to develop qualitative movement which involves awareness of total body alignment, clarity of body shape, and economy of effort attained by combining the most appropriate proportions of the motion factors.

Every Movement Is Not Right

In this paper I have endeavored to do two things: first, to stress that the development of skillful and qualitative movement is just as much a part of educational gymnastics as it is of the more formal kinds of gymnastics, and second, to show one means by which the learner may be helped to work toward skillful qualitative movement as well as being encouraged to develop a wide movement vocabulary.

If we subscribe to the view that everything is acceptable in educational gymnastics we are on dangerous ground educationally. If every movement is right for the person who does it, then nothing can be wrong, and if nothing can be wrong then no standards can be applied. If this is the position we adopt it will be difficult for us to defend our place in an educational institution. If performances can be better than one another, right or wrong, appropriate or inappropriate, then determining whether a particular performance is skillful or not so skilled must be a matter of logical proof.

By logical reasoning criteria are established, and by looking at observable features a movement sequence may be judged as skillful, qualitative, and appropriate. Educational gymnastics generally permits a wider response pattern than Olympic gymnastics and because of this it has been criticized as amenable only to subjective evaluation, as though subjective judgments were incapable of rational verification.

The expert in educational gymnastics will be able to discuss the observable features that make one performance better than another or one process more appropriate than another. Objectivity and subjectivity need not be regarded as a dichotomy. They can be viewed as a continuum from judgments capable of verification through tests and measurements to judgments based on inner feelings in which right and wrong can be evaluated since there is a logical connection between the judgment and the behavior observed.

Both Olympic and educational gymnastics stress skill and excellence of performance, and a number of the same kind of motor patterns will occur in both. It is hoped that this brief review of the differences between the two forms will not be taken as an oversimplification. Olympic gymnastics aims for accuracy and perfection of specific skills, while educational gymnastics aims for excellence of performance within each individual's gymnastic capacity. The former involves specific, recognizable actions; for the latter, larger movement concepts form the content.

Task Progression for Educational Gymnastics

1. Task	Development of variety	1. Initial response from learners' movement vocabulary
2. Further task suggestions		2. Increase the learners' movement vocabulary, encouragement to explore
3. Increasingly limited tasks	Development of skill and quality	3. Gradually confining experience narrowing down the limits of what is an appropriate answer, more precise decision making
4. Directed tasks to refine new skill or quality of movement		4. Specific response demanded
5. Further tasks increasingly inventive	Application of skill and quality to new situation	5. Permitting use and application of newly acquired skill or quality to new situations.

The aims and content of Olympic gymnastics suggest that most often the teacher will direct and control the learning process in order to achieve accuracy and efficiency quickly and safely. The aims and content of educational gymnastics allow for a wider range of teaching and learning strategies, exploiting all possible facets of the learning experience. The large amount of decision-making available to teachers of educational gymnastics makes it a difficult form of gymnastic movement to teach well. Considerable understanding of both children and the form of gymnastics is essential.

When the process and the product of educational gymnastics are interdependent it can be infinitely rewarding. Individual inventiveness as well as excellence in skillful, qualitative movement can be attained by learners of all ability.

Endnotes

1. Mauldon, E., and Layson, J. *Teaching gymnastics*, London: Macdonald & Evans, 1965.
2. Williams, J. *Themes for educational gymnastics*. London: Lepus Books, 1974.
3. McFee, G. What is the medium of gymnastics? In *Focus on gymnastics*, published by the Association of Principals of Women's Colleges of Physical Education Conferences, Eastbourne, East Sussex, England, 1975-76.
4. Ibid.
5. Carroll, J. Social perspectives on gymnastics, in *Focus on gymnastics*, op. cit.
6. Williams, J. The importance of gymnastics for individual development, in *Focus on gymnastics*, op. cit.
7. Wright, J. Composition in educational gymnastics, in *Focus on gymnastics*, op. cit.

Nothing Short of a Revolution

Sam Baumgarten

A brief glance at the daily newspapers, a quick look at the evening news on television, or even a visit to a local youth league contest is enough to tell us that the world of athletics (and, in fact, the world at large) is seriously ill. Here is a sampling of the symptoms:

- Recruiting violations and scandals in high schools and colleges.
- Low graduation rates for athletes at many of our major universities.
- The use of drugs—steroids and amphetamines, for example—to gain an edge over the opponent.
- The covering up of drug abuse or other violations of team rules so that star athletes will not be suspended from playing.
- Unsportsman-like conduct by coaches, players, parents, and fans in the form of booing, fighting, vandalism, and harassment of officials.
- Increased brawling among players, not only in hockey, but in baseball and basketball as well.
- The need for rules in high school and college sports to restrain coaches in their seats.
- The playing of only the best players on the team, while substitutes warm the bench and rarely get to play.
- The creation of "failure" situations by not taking into account the developmental levels of children.
- The abuse, occasionally physical but most often verbal (and even nonverbal, e.g., disappointed or angry facial expressions), that is imposed upon children when they "fail" in sports situations.

This list of symptoms is sufficient to help us diagnose the illness, and it is clear to this "doctor" that the disease we are looking at is competition, or, as Terry Orlick stated in his provocative work, *Winning Through Cooperation*, "a competitive insanity," with its accompanying corruption and distortion of human values, at all levels and in all domains (1978, pp. 15-16). Competition, by its very nature, creates winners and losers. Those who win do so at the expense of others, and this inherent conflict, this need to win by beating others, can lead to the problems cited above. In addition, the reasons for competing and the rules, structures, and methods through which we compete are also part of the illness.

Mixing the medical metaphor with the political will switch our focus to the act of revolution in thinking about a cure. In checking a dictionary or thesaurus for the meaning of the word "revolution," the following phrases would appear: "a complete and forceful overthrow of an established system," "a radical and pervasive change in society and the social structure," "clean sweep," and "striking alteration." There is no question in my mind that the illness can be cured if, as responsible adults, coaches, and teachers, we are willing to start a revolution and make radical changes, for nothing short of a revolution will do the trick!

Currently, those in power in the world of sports are implementing changes which are certainly far short of the radical approaches which are necessary. These "band aid" approaches include the formulation of a new rule about recruiting, another about fighting, or another about equal playing time. But these changes do not attack the underlying infection, an infection which is rooted in the nature of competition and which can be described as the all-consuming desire to win, to be "number one."

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Fortunately, we can eliminate many problems by simply eliminating or markedly reducing competition in schools and towns. This radical solution is perhaps most appropriate and most likely to be accepted at the primary school level. There is absolutely no need to spread the evils of competition among our five-, six-, seven-, eight-, and nine-year-olds in school settings through a steady diet of dodgeball, kickball, relay races, and other mass games, which, by their very nature, prevent so many children from feeling good about themselves and their movement abilities, and which are usually detrimental to the development and improvement of motor skills.

As professionals, we can urge the elimination of youth leagues for these age groups as well, since most youngsters at this level possess neither the skills nor knowledge to play the major sports with much chance for success. The children lack the maturity and a sufficiently strong self-concept to deal with leagues which are, for the most part, organized according to the adult models, with standings, playoffs, championships, trophies, and all-star selections. We must not let the children's self-esteem depend on their success or failure in these inappropriate situations.

For many people, even this change, the elimination of competition at younger age levels, is too radical to think about because competition is so pervasive in our society. Hence, it is likely that even fewer people would consider the elimination of competition for older individuals, age 10 and up. The revolutionaries, then, may have to start with somewhat less drastic changes, the first of which could be to simply tell children that it's acceptable *not* to compete. (Often, kids compete because they are told that they must participate in competitive sports in order to be part of the group.) With this option available, many children, I'm sure, would opt out of competition. Adults can assist this option by offering more cooperative games, many of which are described in some revolutionary books: *The New Games Book* (1976), *More New Games* (1981), *Playfair* (1980), *The Cooperative Sports and Games Book* (1978), and *The Second Cooperative Sports and Games Book* (1982). Additionally, adults can encourage a return to less formal, sandlot, or playground types of play.

But, assuming we still have many competing in more formal settings, our next striking alterations must come in the "why" and "how" of competition. In terms of the "why" of competition, the major change must clearly be the elimination of the "win at all costs" philosophy, and perhaps even the redefining of the term "winning." Referring again to Orlick, he confronted this issue succinctly and powerfully by pointing out that when the result of a game, that is, the winning or losing, becomes more important than what's happening to the people playing, we have a destructive situation. On the other hand, sports can serve people if the outcome of the game is never allowed to be more important than the individuals involved (1978, pp. 69-77, 113-134). The Chinese motto, "Friendship first, competition second," can and should become a reality in the American sports scene.

In terms of redefinition, if we can look at winning as the striving for excellence, through our own efforts and with the help of others, rather than simply the act of beating another person or team, the illness, infection, and symptoms would disappear at once. If being "number one" was not part of our aims, coaches would not need to recruit, and players would not need to cheat or look upon opponents as enemies. Players and officials would treat each other respectfully since, with the outcome of the game less important, any mistakes or errors would be looked upon as just part of the game and not as reasons for verbal or physical abuse. We would not hear such comments as, "If the ref doesn't see it, it's okay," or "If he gets in your way, knock him over." Further, our youngest athletes would all be allowed to play, and rules would not be needed to require coaches to play everyone a certain amount of time. The coaches would do so automatically because it's right! This redefinition would gradually allow the abuses to be replaced by a sincere and positive concern for the health and welfare of each participant, and we would applaud and recognize the efforts and skills of all players.

The course of competition can also be altered when, in looking at the goals of a program, winning becomes the last goal on the list or, perhaps, is not even listed. More important goals or focuses would include for each participant: psychological well-being, feelings of acceptance, inclusion (which means modifications of rules which will allow all to succeed in the skills of the particular sport), improved self-image, fun, respect and concern for others, honesty, fair play, the development of physical fitness and motor skills, and building a desire for lifelong participation. We can and must implement such goals and not simply pay lip service to them.

In this refocusing of our goals, greater attention is given to the process rather than the product. Consider these words of Alfie Kohn:

> If we are obliged to participate in . . . competition, we can . . . shift to what I have called "process competition" by directing attention away from the results of an activity. If we are playing a competitive game, we ought not to keep score. . . . We should at least avoid awarding any prizes or making a fuss over the victor. By minimizing the significance of winning, we automatically soften the blow of losing. Whenever we take part in a contest, we can try to nest it in fellowship: by making a special effort to fortify the

The world of athletics is suffering from the disease of competition, with its accompanying corruption and distortion of human values.

> bonds between competitors, the destructive effects of having to work against each other can be eased a bit. Friendly gestures to rivals will be reciprocated. . . . (1986, p. 185)

With our goals refocused and our attention shifted to the process, a more in-depth look can be taken at the "how" aspect of competition. The design of the program should be based on the needs of the youngsters and not on the needs of adults. Youth league and physical education class games should be "kid-sized," not adult-sized. Games should be played on smaller fields and with smaller teams that are evenly balanced. Teams should be changed as needed to ensure balanced competition. (There is no reason to persist with permanent teams and leagues when some teams are much stronger or much weaker than others.) Everyone should play an equal amount of time—even in high school and college—and positions should be changed regularly. Other adjustments might include using different sized balls or goals, adding or eliminating certain rules, and allowing second chances on rules violations. Some of these variations might hold for an entire league, or, in a game like baseball, might change from batter to batter.

At all levels of play, and even when the age group of youngsters involved permits the playing of the "regular" game, respectful behavior should be insisted upon by those in charge and should be modeled by all who are in leadership roles. Players should be spoken to in a courteous manner and treated with dignity. Officials can be questioned quietly and calmly. A simple, yet powerful tool, the pre- and post-game handshake, should be restored and should replace the perfunctory hand slap, which is meaningless. Moreover, to take a page from past years of girls' athletics, pre- and post-game socializing between teams can be instituted or restored. (Isn't it interesting that professional sports leagues find it necessary to make rules against fraternizing with opponents, thus denying the opportunity to build relationships?)

In the school setting, intramural programs for all students should once again take precedence over interscholastic athletics for the few, and on the interschool level regional and national playoffs should be reduced or eliminated. Further, as often suggested by those close to the college scene, recruiting can be curtailed, athletic scholarships and booster clubs discontinued, coaching staffs reduced, and seasons shortened. (The fact that these suggestions have often been made in the past, yet have still not been implemented indicates how entrenched the structure is and why revolutionaries are needed.)

For many caring and concerned teachers, parents, and coaches, the modifications suggested in this essay, these "revolutionary acts," are already the norm. But, unfortunately, there are too many individuals who aren't getting the message, who aren't putting the welfare and total development of youngsters at the forefront of their thinking. It is the responsibility of teachers, coaches, and athletic directors to make the necessary changes in the school setting, and, further, I believe that it is our responsibility to become involved in and help direct town programs as well.

It may be true, as Kohn suggests, that competition, by its very nature, cannot be beneficial, but based on experiences with a modified soccer program at the Burnell Campus School over the past five years, it seems that the suggested changes can work. The questions then become: Are you, the professional, willing to do something? Are you willing to risk a challenge to your basic value system, to the competitive ethic which pervades and envelopes society and its sporting endeavors? Are you willing to stop and really think about what's happening to *all* of the youngsters? Are you willing to try to change competition away from a "zero-sum" event, as Kohn puts it, in which for every winner, there is a loser, and toward an event in which there is a positive sum, where all participants gain satisfaction? Are you willing to put to rest the "we're number one" chant? Are you willing to start that revolution today, in your own class, your own school, and your own town?

References

Fluegelman, A. (Ed.). *The New Games book.* Garden City, NY: Doubleday and Company, Inc.

Fluegelman, A. (1981). *More New Games.* Garden City, NY: Doubleday and Company, Inc.

Kohn, A. (1986). *No contest: The case against competition.* Boston: Houghton Mifflin Company.

Orlick, T. (1978). *Winning through cooperation.* Washington, DC: Acropolis Books, Ltd.

Orlick, T. (1978). *The cooperative sports and games book.* New York: Pantheon Books.

Orlick, T. (1982). *The second cooperative sports and games book.* New York: Pantheon Books.

Weinstein, M., & Goodman, J. (1980). *Playfair.* San Luis Obispo, CA: Impact Publishers.

Elementary Physical Education: Color It Androgynous

Arlene A. Ignico

Students enter school with several years of gender-role socialization behind them, and unfortunately learn even more about stereotypical gender roles from their teachers. This frequently happens through the physical educ[illegible] program. Numerous studies and reports have consistently demonstrated that teachers have gender-differentiated behavior patterns; that is, they teach boys and girls differently and have varied expectations from them. They often (and sometimes unknowingly) reinforce gender-role stereotyping and provide different experiences and programs for girls and boys. Because of their leadership role, teachers help label activities as gender appropriate or inappropriate. In the area of physical education, gender-role stereotyping has many repercussions on the students—some of them damaging.

Physical educators and teachers who handle their own physical education instruction frequently label activities and games in their curriculum according to gender and therefore perpetuate and reinforce stereotypical beliefs. Children usually prefer activities labeled gender-appropriate—girls choose jumping rope, boys choose playing baseball—and give more attention to tasks of this kind. Unfortunately, most team games are labeled male-appropriate and female-inappropriate. Most creative and/or expressive movements and many nonvigorous activities are labeled just the opposite. By communicating biases about the appropriateness of activities to students, teachers create self-fulfilling prophesies. A frequent result is the absence of opportunity for girls and boys to engage in activities considered gender-inappropriate.

Anyone who has witnessed a 13-year-old girl struggle to find where the ball and bat meet knows that we, as educators, have contributed to her lack of batting success. Anyone who has overheard the stinging remarks about an awkward or unathletic boy realizes the rigidity of gender roles.

Do primary grade teachers have these expectancies of children? Why are the boys more often the captains in recess games? Why do they assume the most important positions on the field? One obvious reason is that traditional girls' games like hopscotch, jump rope, and gymnastics involve simple rules and no team strategy, and boys' games demand group interaction, leadership, and assertiveness.

Quite clearly, these "male" activities provide boys with the opportunity to develop good leadership skills, make decisions easily, and take a stand with confidence. They don't provide an opportunity to develop warmth and sensitivity to others, however. In contrast, the "female" activities teach girls how to be gentle, affectionate, sympathetic, and loyal. They don't provide the opportunity to develop analytical skills, self-reliance, and self-sufficiency. As is evidenced by the traditional career choices of women and men, these lessons are well-learned.

It is apparent that two-way interactions occur between teachers and students. Both have ideas about the gender appropriateness of various activities and tend to reinforce each other. A child's evolving perception of gender role is greatly influenced by a teacher's behavior and expectancy. Since the consequences are potentially damaging, it is vital for teachers to examine how they label various activities according to gender.

Perhaps the surest solution to gender-role stereotyping is the development of an androgynous curriculum framework. This curriculum would encourage

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exploration of traditionally male and female activities and dispel the gender labels that society has attached to them. Recess games would become purposeful, structured, and gender-free. An initial step toward this goal is to encourage girls to bring active wear for physical education and recess, since dresses are inappropriate for vigorous physical play. Teachers might also select one boy captain and one girl captain for recess games each morning. All field positions could be equally divided by gender with girls and boys alternating as pitcher.

Creative teachers can find many ways to change hopscotch and jump rope into coed activities. Coed tournaments are popular with children, as are participation awards based on points accumulated for fitness activity involvement. To complete this strategy, both male and female teachers could become active role models in "cross-gender" activities.

Since research and everyday observation suggest that young girls and boys do not significantly differ in their physiological capabilities, instruction within an androgynous physical education program could be gender-free. The most important goal of an androgynous curriculum is the creation of a nonexclusive environment. Exclusive language must not be used: it *does* make a difference when children hear someone described as "he" rather than "he or she" or as "man" rather than "player." Leading by example is the first step toward school-wide awareness of the importance of nonexclusive language.

Creative teachers find ways to show that success is not gender-related.

An androgynous physical education curriculum might include a performance by an accomplished male ballet dancer prior to a unit on dance or a demonstration by a high school or university women's basketball team showing the techniques of dribbling, passing, and shooting. If appropriate role models are not available, film would be an excellent substitute. Gymnasiums in a role-free program would display pictures of female athletes participating in team sports such as softball and basketball and male athletes participating in individual sports such as gymnastics.

Most importantly, this curriculum would blend both feminine and masculine characteristics into the personality of each student. Through such a program, children will learn that success is androgynous.

References

Brawley, L., Powers, R., & Phillips, K. (1980). Sex bias in evaluating motor activity: General or task-specific performance expectancy? *Journal of Sport Psychology*, 2, 279-287.

Bridges, J., & DelCiampo, J. (1981). Children's perception of the competence of boys and girls. *Perceptual and Motor Skills*, 52, 503-506.

Corbin, C., & Nix, C. (1979). Sex typing of physical activities and success predictions of children before and after cross-sex competition. *Journal of Sport Psychology*, 1, 43-52.

Fagot, B. (1977). Consequences of moderate cross-gender behavior in preschool children. *Child Development*, 48, 902-907.

Greendorfer, S. (1978). Gender differences in physical activity. *Motor Skills: Theory into Practice*, 4, 83-90.

Herkowitz, J. (1980). Social-psychological correlates to motor development. In C. Corbin (Ed.), *A textbook of motor development* (2nd ed.). Dubuque, IA: William C. Brown.

Housner, L. (1981). Sex role stereotyping: Implications for teaching elementary physical education. *Motor Skills*, 5, 107-116.

Lever, J. (1978). Sex differences in the complexity of children's play and games. *American Sociological Review*, 43, 471-483.

Montemayor, R. (1974). Children's performance in a game and their attraction to it as a function of sex-typed labels. *Child Development*, 45, 1152-1156.

Pitcher, E., & Schultz, L. (1983). *Boys and girls at play: The development of sex roles*. New York: Bergin & Garvey.

Thompson, S. (1975). Gender labels and early sex role development. *Child Development*, 46, 339-347.

Running Backwards in a Relay Race

Kate R. Barrett
Lynne P. Gaskin

Brown v. Burlington City Board of Education

A minor, Lori Brown, through her father, filed a complaint against the school district, her physical education teacher, and the teacher's aide for injuries she suffered while participating in a relay race in which the sixth grade students were required to run backwards on an asphalt playground area during a physical education class. While participating in the activity, Lori fell backwards on the asphalt surface and sustained painful and disabling injuries to both arms. Questions were raised and negligence alleged regarding failure to issue proper guidelines for physical education activities, lack of knowledge about Lori's ability in physical activity in general and running backwards, specifically, and the unsuitability of the surface on which the activity was conducted (*Brown v. Burlington City Board of Education, 1986*).

Last year, Kate Barrett served as an expert witness for the case described above. As an expert witness, she was asked to write a formal report focused on the appropriateness or inappropriateness of running backwards as required in this situation. Following is the original report and a commentary on the case by a colleague, Lynne Gaskin, an assistant professor of physical education with expertise in legal issues in physical education and sport. Barrett's report and Gaskin's comments raise important issues upon which teachers and administrators should reflect.

Barrett's report

Running backwards as a motor skill. Running backwards is a difficult motor skill to perform and is not considered "fundamental" and therefore is not a "basic motor skill." Basic motor skills, as content for physical education classes, have been and still are traditionally categorized into three large areas: locomotor, nonlocomotor, and manipulative. In all cases, when teachers of physical education speak of these skills, they speak of them as skills that children need to learn to perform efficiently and effectively for they serve as a base or foundation for the most complex motor skills used in games and sports, dance, gymnastics, and aquatics (Haywood, 1986; Roberton & Halverson, 1984; Wickstrom, 1983). It is well documented that basic motor skill development requires instruction on the part

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of the teacher as these basic skills do not develop by maturation alone (Eckert, 1987; Haywood, 1986; Roberton & Halverson, 1984). The need for instruction implies that the skill, in this case running backwards (an advanced form of the basic skill of "running"), has to "be learned."

It should be noted that "running backwards," quickly and for a considerable distance, is not required in our sports or daily life skills. Running backwards, when needed in sports, is most often integrated with running forward and sideward (quickly) and for very short distances. Players needing to cover long distances would turn their bodies and run forwards, not backwards. Running backwards is a motor skill and extremely difficult to perform where distance must be covered quickly and where the player has to perform it in relation to what other players are doing (players reacting to other players' movement).

The complex nature of running backwards is because of the "backward direction," and includes such factors as a decrease in the range of motion (legs, trunk, arms), a difficult visual problem (a child must turn his/her head to see where he/she is going), and a very small base of support when the weight is initially taken on the foot (toes) as it makes contact with the supporting surface (in this case asphalt). Additionally, when the head is turned, this action affects the upper trunk (it tends to rotate toward the side to which the head is turned) and hip area (it, too, may turn in the same direction) thus making the running action of the legs more difficult to perform (feet are apt to touch each other and cause the runner "to trip over his/her own feet"). Because of the decrease in range of motion, visual and balance problem, and small base of support, the potential to fall backwards is a continuous risk. From our knowledge of postural reactions, when the body is thrown off balance in a backward direction (which occurs when you are running backwards and begin to fall in that direction) backward extension of the arms occurs. This is called a "parachute reaction" (extension reactions in the limbs when sudden displacement of the erect trunk occurs) (Milani-Comparetti & Gidoni, 1967; Roberton, 1984).

Running backwards as a competitive (speed) event. A relay race by definition is a "competitive event" in which teams try to be the first to complete the race. Any competitive event, in this case the relay race, often produces a certain anxiety in those participating. Because of the competitive nature of relay races, physical education teachers must select only those motor skills which are appropriate. This means those motor skills that have a higher risk for injury while being performed in this type of situation should not be used. For example, if a physical eduction teacher wanted to use a motor skill in a "challenge type" situation (a relay race falls under this category) she/he must analyze the motor skill in question to decide the type of "challenge" to give the children (is it appropriate to be "competitive" or is it appropriate to be "self testing/non competitive"?) (Nichols, 1986).

Because of the complex nature of running backwards, this skill is not an acceptable one for a "speed" event and an event that is competitive (e.g. a relay race). Running backwards has too great a risk for falling and potential injury to the wrist and arms (backward parachute reaction).

For motor skills such as running backwards, children need to practice and perform them at their own pace and level of skill. For example, children could be asked to run *easily*, and *at their own pace*, forward, backward, and sideward. The teacher would stress a safe/careful use of the space in which the activity was being conducted and the speed at which the children performed the activity. While the children were performing this task, the teacher would instruct them (teach them) how to be light on their feet, how to keep their weight over their base of support (feet) so they could keep their balance while "running" in different directions, and how to avoid getting near or touching others (Gallahue, 1987; Graham, Holt/Hale, Parker, 1987; Logsdon, Barrett, Ammons, Broer, Halverson, McGee, & Roberton, 1984; Nichols, 1986; North Carolina Department of Public Instruction, 1985). In all learning experiences of this nature there would be plenty of space between children, and children would be taught how to use the space effectively and safely.

Knowledge of children's skill level. In addition to the need for teachers to select appropriate motor skills when considering the use of a relay race as an activity, teachers of physical education should not have children take part in competitive events unless they have (a) a pre-knowledge of the capability of all children in the class as to their skill level while performing the particular motor skill under different situations and (b) a full understanding of how the competitive situation (in this case the relay race) can affect the children's performance level.

Whenever teachers design activities that are competitive in nature, they must know the skill level of the children participating. This means that the children's ability to perform the motor skill in question needs to be "strong" enough to withstand a more challenging situation. Knowledge of this type would come from the teachers' past lessons, lessons in which they would have progressively prepared the children for each succeeding activity. When applying this standard to a new school year, it requires that teachers take time at the beginning of the semester to design activities that allow them to assess the level of motor skill development of the children in their class. How long this takes and the manner in which this planning occurs is dependent upon the teachers' familiarity with the children in their class and the children's physical education background.

Gaskin's comment

This case did not produce a final decision by a jury since the plaintiff and defendant agreed to an out-of-court settlement. The basis for the settlement of the case in Lori's favor was the written statement by Barrett, a recognized authority in children's physical education. Barrett concluded that requiring a child to participate in a relay race in which the student had to run backwards the length of an asphalt basketball court violates the standards of good teaching in physical education. In her opinion, the risk of injury to the child was foreseeable and unreasonable.

In her analysis, Barrett focused on two issues: running backwards as a motor skill in a competitive situation, and the importance of teachers' knowing the skill level of their students. In addition to these two issues, use of the asphalt surface (whether it was structurally sound and free of defects) was questioned. Barrett did not address this issue since her area of expertise is the development of motor skill and not the suitability of playground surfaces.

While the suitability of the surface had no bearing on the settlement of this case, the surface on which activities are conducted may be important in future cases. Professional and legal sources and standards exist regarding the installation and maintenance of surfaces on which apparatus is placed. However, there is little information that addresses the use of an asphalt, concrete, blacktop, macadam, or any other hard surface for an activity that does not involve apparatus. Additionally, only two cases reaching the appellate level were located, and the courts in both considered primarily the *maintenance* of a hard surface for physical education classes as opposed to the *use* of the surface (Dobbins v. Board of Education of Henry Hudson Regional School, 1975; McKenna v. Board of Education, 1945).

Physical educators are ultimately responsible for making decisions about the appropriateness of the surface on which class activities will occur. When selecting a surface/area to be used for class (grass, asphalt, etc.), teachers should make sure the surface is conducive to skill development in that activity and facilitates the safe conduct of that activity. A recent publication recommended by and available from AAHPERD will assist educators who are responsible for selecting and maintaining safe outdoor activity areas (Moore, Goltsman, & Iacofano, 1987).

The premise of the case under discussion (Brown v. Burlington City Board of Education, 1986) is that the proximate cause of the injury was running backwards and that a teacher should have been able to foresee that the activity itself could cause serious injury (regardless of the surface on which it was conducted). In today's highly litigious society, it is always possible that a lawsuit will be brought against a teacher in whose class a student is injured. Although teachers are not expected to ensure the safety of students in their classes, they are expected to protect students against unreasonable risks of harm (Riffer, 1985). By law, teachers are held to a standard that would be reasonably expected for other physical educators in the same or similar circumstances. The Brown case (1986) is an excellent example of a teacher's alleged negligence in failing to weigh the risk of potential injury against the benefits derived from the activity.

Are Your Class Activities Safe?

In considering any activity for inclusion in physical education, the teacher should pose several questions:

1. Is "X" (running backwards in a relay race) included in my school district's physical education curriculum guide?
2. Is "X" (running backwards in a relay race) an appropriate activity for the skill level of my students?
3. Is the inclusion of "X" (running backwards in a relay race) supported by experts in physical education?
4. Would a reasonable physical educator include "X" (running backwards in a relay race) as an acceptable class activity?

One of the most important lessons to be learned from this case is the need to think through activities to be included in physical education classes. As a planned activity in a physical education class, running backwards in a relay race (running swiftly rather than safely) is questionable at best.

Physical education teachers have a legal duty to provide reasonable instruction, supervision, safe equipment and facilities, and progression in curricular activities. They are expected to recognize foreseeable risks in activities and ascertain whether the benefits derived by each student engaging in the activity outweigh the risks of potential serious injury. As professionals, teachers are expected to recognize that the risks in some activities are too great for students to assume.

Many school-related injuries are related to the nature of children engaged in physical activity and are the result of unavoidable accidents. However, if injuries are foreseeable and could have been prevented through exercising reasonable care, a teacher or school district may well be held liable for injuries to students.

References

Brown v. Burlington City Board of Education, Alamance County File Number 86 CvS 821 (June 4, 1986).

Dobbins v. Board of Education of Henry Hudson Regional School, 67 NJ69, 335 A2d 23 (1975).

Eckert, H.M. (1987). *Motor development* (3rd ed.). Indianapolis, IN: Benchmark.

Gallahue, D. (1987). *Developmental physical education for elementary school children*. New York: Macmillan.

Graham, G., Holt/Hale, S.A., & Parker, M. (1987). *Children moving: A teacher's guide to developing a successful physical education program*. Palo Alto, CA: Mayfield.

Haywood, K.M. (1986). *Life span motor development*. Champaign, IL: Human Kinetics.

Logsdon, B.J., Barrett, K.R., Ammons, M., Broer, M.R., Halverson, L.E., McGee, R., & Roberton, M.A. (1984). *Physical education for children: A focus on the teaching process* (2nd ed.). Philadelphia, PA: Lea & Febiger.

McKenna v. Board of Education, 269 AD 666, 52 NY52d 852 (1945).

Milani-Comparetti, A., & Gidoni, E. (1967). Routine developmental examination in normal and retarded children. *Developmental Medicine and Child Neurology*, 9, 631-638.

Moore, R.C., Goltsman, S.M., & Iacofano, D.S. (Eds.). (1987). *Play for all guidelines: Planning, design, and management of outdoor play settings for all children*. Berkeley, CA: MIG Communications.

Nichols, B. (1986). *Moving and learning*. St. Louis, MO: Times Mirror/Mosby.

North Carolina Department of Public Instruction. (1985). *Teacher handbook, healthful living K-12*. Raleigh, NC: Division of Healthful Living, Instructional Services, North Carolina Department of Public Instruction.

Riffer, J.K. (1985). *Sports and recreational injuries*. Colorado Springs, CO: McGraw-Hill.

Roberton, M.A. (1984). Changing motor patterns during childhood. In J.R. Thomas (Ed.), *Motor development during childhood and adolescence* (pp.48-90). Minneapolis, MN: Burgess.

Roberton, M.A., & Halverson, L.E. (1984). *Developing children - Their changing movement*. Philadelphia, PA: Lea & Febiger.

Wickstrom, R. (1983). *Fundamental motor patterns* (3rd ed.). Philadelphia, PA: Lea & Febiger.

Legal Perspectives for Elementary School Physical Education

Boyd B. Baker

The overwhelming majority of teachers of elementary school physical education, be they self-contained classroom teachers or physical education specialists, have never had formal education in the legal aspects of teaching physical education. That teacher-education programs would omit such critical subject matter from their curricula is but part of the tragedy. Teachers who are ill-prepared to deal with a litigious society because of their lack of information about the legal parameters within which they operate might naively or accidentally injure children — this is the real tragedy. Why should our students pay the price for their teachers' lack of education?

It could have been said less than a decade ago that little information was available — the professionals in the field did not provide workshops or clinics in this all-important area, and even national professional organizations and societies apparently felt no need to enlighten their members in this field. Obviously, this is no longer true. But the problem remains! Daily, our young people are exposed to improper activity selection and teaching methodology; faulty supervision; dangerous or defective equipment, buildings, and facilities; inappropriate transportation procedures; and improper care of injuries. The answer is not to abandon the program! Likewise, the answer is not to continue sacrificing the health and well-being of our young people until, through trial and error, we magically become solid, conscientious teachers. As caring professionals we need to become thoroughly educated regarding our legal responsibilities when teaching elementary school physical education.

The following areas of concern are discussed to provide the reader with basic, bare-bones information as well as a "cardinal rule" to guide further endeavors in these areas.

Supervision. Never absent yourself from those for whom you have supervisory responsibility. Courts are reluctant to listen to excuses about why you were absent from your teaching station. In some states, certification is required to fulfill the legal duty to supervise. Duty schedules must be observed without exception. Arrive early, stay late. Supervision is a full-time task — additional duties must not be given or accepted.

Methodology. Bring all aspects of curriculum, activity selection, and methodology up to today's standards. Just because it's fun doesn't ensure that it's legally defensible. Dodgeball can be dangerous if improperly played. Curriculum guides are a must. If your district doesn't have one, make one. If it does have one, make sure it is current. The plaintiff's attorney will know what's in it — do you?

Equipment, Buildings, Facilities. You have a legal duty to inspect all equipment, buildings, and facilities your young people use. When was the last time you did this? One of our primary defenses, assumption of risk, generally does not hold if the injury was produced by faulty equipment, buildings, or facilities. Inspect regularly using a checklist, and place substandard equipment off-limits.

Transportation. Never transport students in private vehicles. If your district is unable or unwilling to provide safe methods of transportation, don't go! The use of private vehicles can have many negative ramifications, not the least of which are insurance policy restrictions.

Injuries. Don't make an emergency out of a non-emergency. Be thoroughly knowledgeable about the common kinds of injuries which are likely to occur in your programs and be equally knowledgeable about how to properly provide emergency care for the injured until expert medical care is rendered. Know the precise health status of each of your pupils prior to undertaking an activity.

Our young people are our most prized possessions. They deserve to be taught by the best teachers in the land. We may be good teachers, but we need to become a little better.

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Parent Intervention Program

Penelope A. Portman

Editor's Note: This article describes an exciting program in which a physical education teacher is helping children to develop basic motor skills. While the author has involved parents in practicing at home with their children, the program might also be used effectively in a peer tutoring situation. In either form, it represents a chance for children who need a little extra practice to succeed in physical education on a level with their peers.

Every physical education class includes students displaying a variety of skill proficiency levels. As teachers, we are responsible for creating a positive learning environment and developing tasks which allow children the opportunity to move from an earlier to a more mature level of skill proficiency. Some children, especially those at the precontrol level (Graham, Holt/Hale, & Parker, 1987), may need more practice than that available in the physical education setting in order to move to the next level of skill proficiency.

Though the development of fundamental motor skills (catching, dribbling, hopping, jumping, kicking, running, and throwing) is guided by maturation rates, most motor skills do not develop without lots of appropriate practice. To help the child who could benefit from additional practice, I designed a Parent Intervention Program to encourage parents to practice motor skills with their children. This program provides extra practice opportunity in an effort to improve a child's skill level. The program was developed for children in kindergarten through third grade who were on a precontrol level when their peers were demonstrating control levels of skill proficiency or higher. The purpose of this article is twofold: first to explain how to use the Parent Intervention Program, and second, to share some of the resultsof using the Parent Intervention Program in my elementary school.

Identification and Evaluation

Children at the precontrol level are identified initially by the physical education teacher or classroom teacher and evaluated using the levels of skill proficiency as outlined by Graham and colleagues in *Children Moving: A Reflective Approach to Teaching Physical Education* (1987). Children either individually or within the class are asked to run, skip, jump, bounce a ball, throw, catch, and kick under simple conditions. The motor skill pattern demonstrated by the child is noted on prepared forms (see Figure 1). If the child demonstrates

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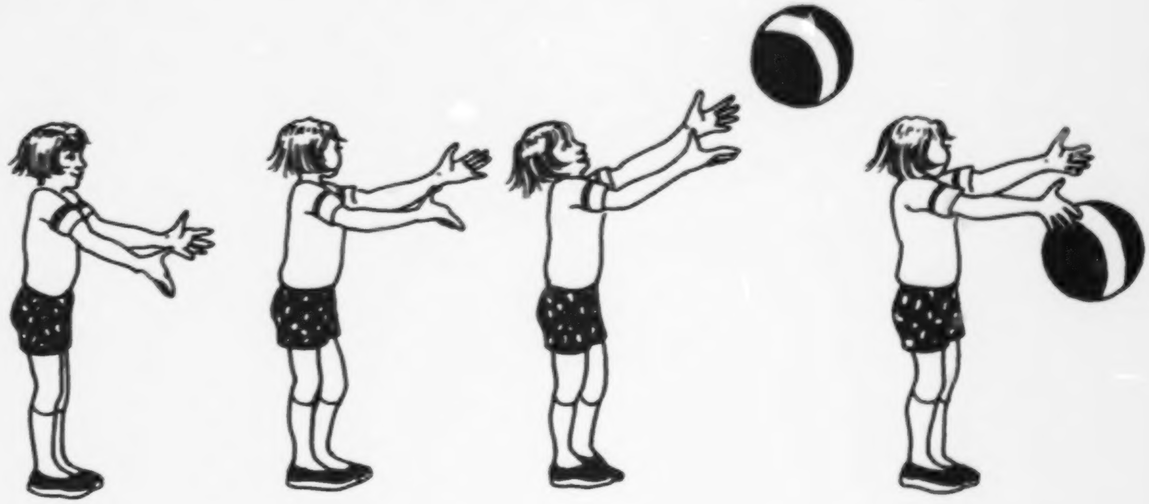
Figure 1. Evaluation Form.

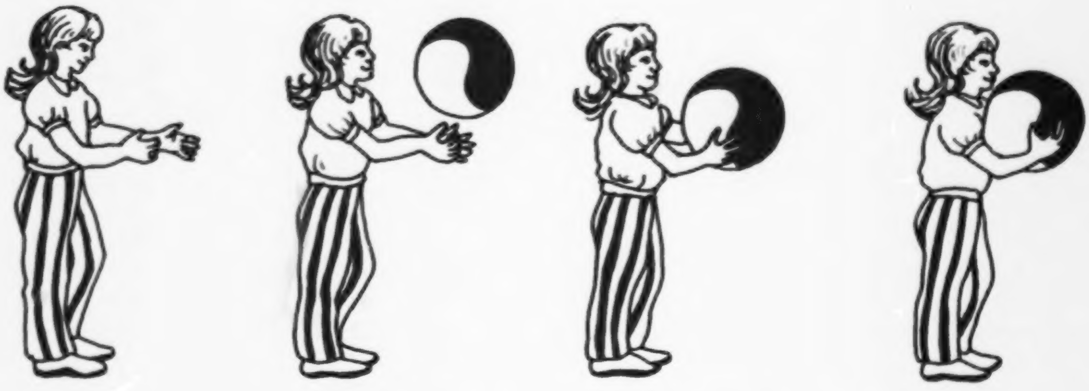
Child's Name ______________________________

Date ______________________________

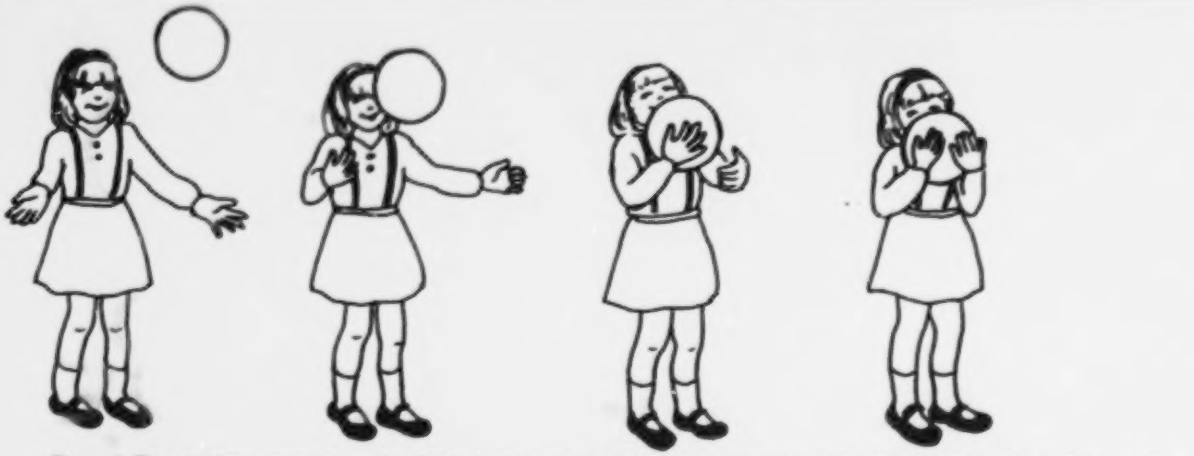
Directions: Circle the stage level which most closely approximates the child's throwing pattern.



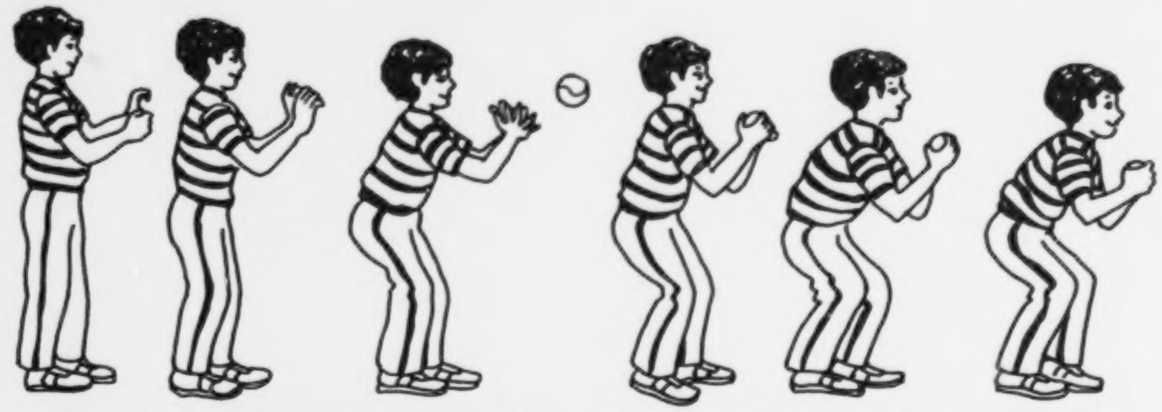
Stage 1: The child places his arms directly in front of his body with the elbows extended and the palms facing upward or inward. As the ball contacts the hands or arms, the elbows are flexed as the arms and hands attempt to secure the ball by holding it against the chest.



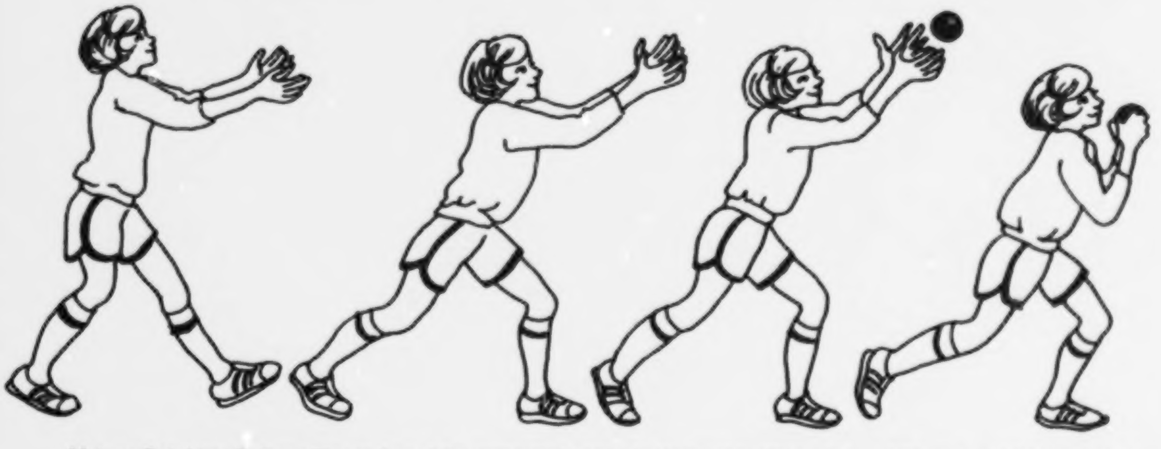
Stage 2: The child prepares to receive the object with the arms in front of the body, the elbows extended or slightly flexed. As the ball reaches the child, his arms begin an encircling motion that culminates by securing the ball against the chest. The receiver initiates the arm action prior to ball-arm contact.



Stage 3: The child prepares to receive the ball with arms slightly flexed and extended at the shoulder. Many children also receive the ball with arms flexed at the elbows, with the elbows out in front of the body. Substage a: The child uses his chest as the first contact point with the ball and attempts to secure the ball by holding it to his chest with the arms and hands. Substage b: The child attempts to catch the ball with his hands. Upon failure to hold it securely, he maneuvers it to his chest, where it is controlled by his arms and hands.



Stage 4: The child prepares to receive the ball by flexing the elbows and placing the arms in front of the body. Skillful performers may keep the elbows at the sides and flex the arms simultaneously as they bring them forward to meet the ball. The ball is caught with the hands, without making contact with any other body parts.



Mature Catching Pattern: The action of the arms and hands is identical to Stage 4. In addition, the child is required to change his stationary base in order to receive the ball. Stage 5 is included because of the difficulty many children encounter when they are required to move in relation to an approaching object.

some or all skills at a precontrol level, the child becomes eligible to begin the Parent Intervention Program. Although each child is tested in all of above motor skills, for purposes of brevity this paper will report only on catching.

Individualizing the Program

A set of visual and text materials illustrating the stages of motor development was developed and compiled for parents' use. Information indicating the level of the child's current performance, the next level of expected performance, and a practice drill to increase the performance level was provided to the parents in the form of a booklet. The less mature skill pattern demonstrated by the student was circled.

For example, if the child caught the ball against the chest, a circle would be made around the appropriate figure in Stage 2 of catching (see Figure 2). A practice drill would then be given. In this case, parents would be instructed to practice the catching drill with their child until the child masters the higher skill level. When this is accomplished, the child checks back with the teacher for a new drill. One drill is provided for each motor skill.

The Parent's Task

Parent conferences are needed to explain the evaluation process and the information you've prepared. In lieu of many individual parent conferences, invite parents to a group meeting. Giving parents an opportunity to hear about the program and to air concerns about the skill level of their children may provide additional support and encouragement for parents. In my experience, most parents attended the meeting, and indicated a willingness to practice the drills with their child at least three times a week.

During the conference, help the parents set regular practice times with their child. Parents may indicate a desire to implement the program, but fail to set aside a regular time to practice the drills. Some children, especially the older ones, will be able to practice the drills without parents doing much more than checking to see if the child is practicing the skill correctly. The younger children will need closer supervision to perform the skill correctly.

Parents should be reminded that when their child can perform the skill successfully over any two days, the child or parents should contact the physical education teacher for a new drill.

Following Through

After the program is under way, check in with the parents frequently to encourage continual practice of the drills. Sometimes the parents forget to ask about the next drill or need reminding to continue the program. Ask the children about their progress. The ones who are improving will be excited and eager to tell you how they are doing and pleased that you asked; you may be able to encourage and help the ones who are not practicing the drills.

Approximately six months after the parents begin the intervention program, check the skill level of the children again. Parents should also be asked to complete a survey (see Figure 3) indicating their utilization of the individualized skills program.

How Much Time Will It Take?

Conducting the skill level evaluations, individualizing the program, meeting with the parents, and monitoring progress—all these things will use your time, but not a lot of it.

The evaluation takes 20-30 minutes depending on the number of skills being evaluated. Evaluations can be done during planning periods and before or after school. Once the forms and illustrations are copied, the compilation and individualization of your skill information packet takes another 30 minutes. Individual parent conferences will obviously be more time-consuming than a group meeting. Follow-up phone calls can be made in just a few minutes. Considering that parents can provide serious directed skill practice for the children, the investment of 60 to 90 minutes per child does not seem to be too much to spend.

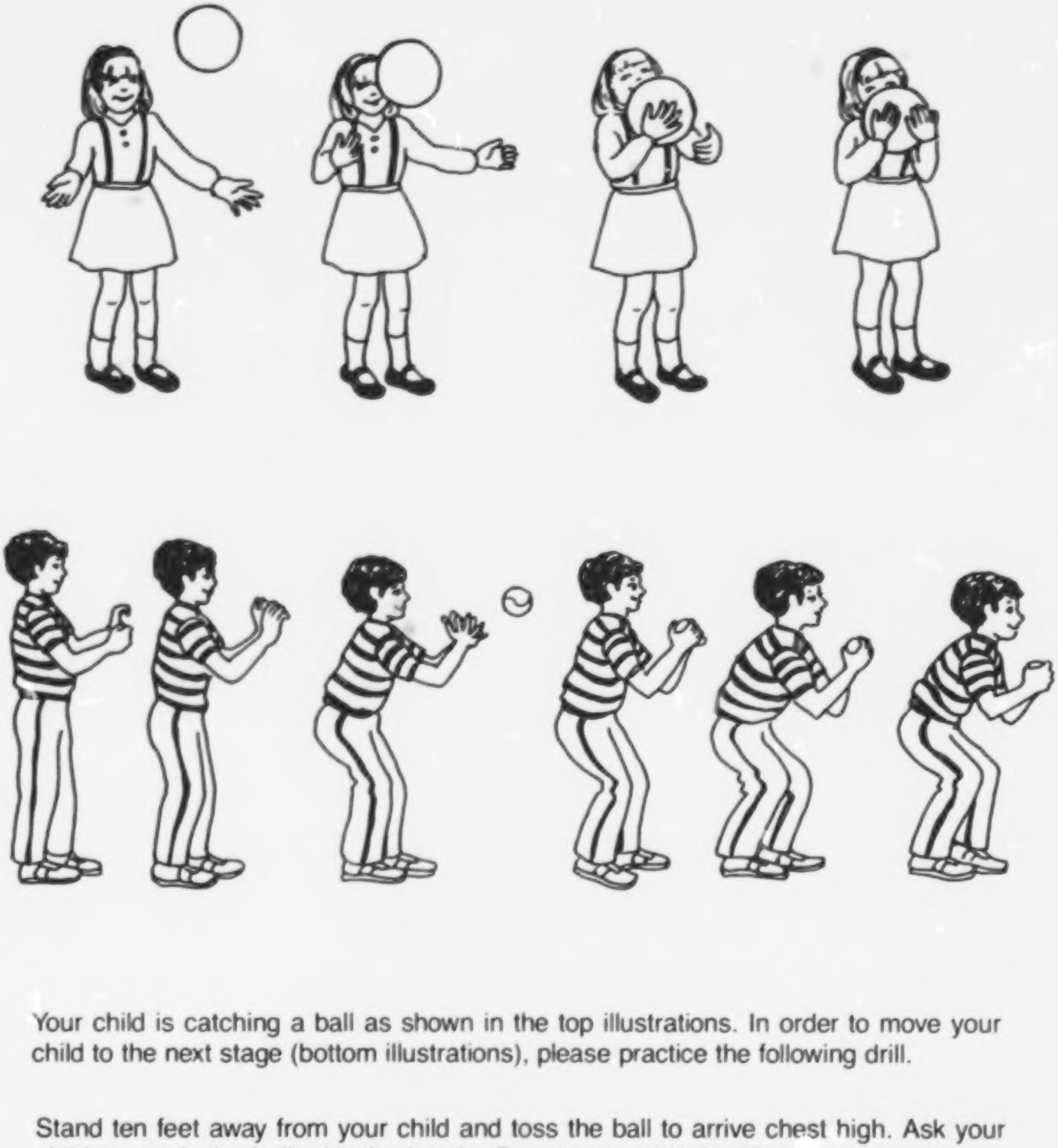
Success Indicators

The Parent Intervention Program was designed for, and implemented in, the elementary school. Thirty-one kindergarten through third graders were initially identified for screening by either the physical education or classroom teacher.

Eighteen of those children demonstrated precontrol levels of skill performance in several of the motor skills. These children became eligible for the intervention program.

Another five children demonstrated precontrol level in only a single motor skill. Their physical education teacher was notified to provide additional practice

Figure 2. Catching Drill.



Your child is catching a ball as shown in the top illustrations. In order to move your child to the next stage (bottom illustrations), please practice the following drill.

Stand ten feet away from your child and toss the ball to arrive chest high. Ask your child to catch the ball with the hands. Practice the drill 20-25 times, three days a week. When your child is successful catching the ball with the hands 15 out of 20 times over two consecutive days, have the child see me for a new drill.

Figure 3. Parent Survey—Motor Skill Practice Program

Recently you were asked to participate in a parent intervention program designed to improve the balance and specific gross motor skills of your child. Your child's current progress is now being re-evaluated. As part of that re-evaluation process your response to this questionnaire would be helpful. Please circle the most appropriate answer or answers, and return this form to the school within one week.

Child's name: ____________________

1. Did you attempt the parent intervention program with your child?
   Yes __________ No __________

2. How often did you practice with your child or encourage your child to practice?
   Every day __________ Every other day __________ Once a week __________

   Occasionally __________ Almost never __________ Never __________

3. How long did you continue the program?
   Never started __________
   Number of weeks __________
   Number of months __________
   Still practicing __________

4. If you have discontinued the program, please state why:
   Too time consuming __________
   Child wasn't interested __________
   Forgot __________
   Skill level accomplished __________
   Program too difficult __________
   Other ____________________

5. Have you seen a change in your child's attitude toward sports or game skills?
   Yes __________ No __________
   If so, how? ____________________
   ____
   ____

6. Have you seen an improvement in your child's skill level?
   Yes __________ No __________
   If yes, in which areas have you seen this improvement?
   Balance, jumping, running, throwing, catching, bouncing, hopping, skipping, kicking.

7. If you were provided with equipment on loan, is your child still using it?
   Yes __________ No __________ Not provided __________

Thank you for your cooperation!

drills for those children whenever the skill was taught. The remaining eight performed the skills at a control level or better.

Evaluating the students six months after beginning the parent intervention program, I found that children whose parents continued the intervention program throughout the six months improved the most; children whose parents discontinued the program after two months improved some; and children whose parents did not attempt the program improved least. Through the survey, parents indicated that they thought the program was easy to use even if they did not continue the program over the entire six month period.

The most important indicator of the success of the program, however, was the children who came to school beaming because they had mastered one of the drills. Success in mastering the drill gave these children the confidence to continue practicing and improving. At the end of the six months, three of the eighteen children decided to join T-ball, a first for them and a delightful surprise for their parents.

Conclusion

Helping children improve in their motor skill performance is an important aspect of teaching elementary physical education. The Parent Intervention Program represents one attempt to help the children who seem to need that extra practice to succeed at a level similar to their peers. Apart from the motor skill improvement, the program has the added benefit of helping parents to play, albeit in a structured setting, with their child.

References

Graham, G., Holt/Hale, S., McEwen, T., & Parker, M. (1980). *Children moving: A reflective approach to teaching physical education*. Palo Alto: Mayfield.

Graham, G., Holt/Hale, S., & Parker, M. (1987). *Children moving: A reflective approach to teaching physical education* (2nd ed.). Palo Alto: Mayfield.

The illustrations used in this article are from *Children Moving: A Reflective Approach to Teaching Physical Education* (pp. 372, 380) by G. Graham, S. Holt/Hale, T. McEwen, and M. Parker, 1980, Palo Alto, CA: Mayfield. Copyright 1980 by Mayfield Publishing. Reprinted with permission.

Physical Best$^{(TM)}$ — PR Tool for the Elementary Physical Educator

If parents and community leaders believe that physical education is important, they are more likely to not only support, but demand, a quality physical education program.

Clayre Petray

Generating public support for quality physical education programs requires a well-conceived public relations plan. The Physical Best program is a valuable tool for developing and promoting quality physical education programs and for gaining the necessary administrative and community support. Physical Best is the fitness education and assessment program sponsored by the American Alliance for Health, Physical Education, Recreation, and Dance. The ultimate goal of this program is to provide children and youth with the fitness experiences, knowledge, and attitudes which will enable them to be fit for life, based upon Corbin's (1981, 1987) higher order objectives.

The Physical Best program includes: (1) a manual, the *Instructor's Guide to Physical Best Education and Assessment* (McSwegin, Pemberton, Petray, & Going, 1988); (2) *Educational Kits: K-6 and 6-12* (AAHPERD, 1989); (3) *Feelin' Good* educational materials (Kuntzleman, 1977; 1989); (4) Physical Best Badges and Certificates; (5) Physical Best Software Program (IBM and Apple II compatible); and (6) Physical Best Poster. The following are aspects of the program which can be used by the elementary physical educator for the purpose of public relations.

The *Instructor's Guide*, the framework of the program, includes information relating to a comprehensive educational plan; physical fitness testing; goal setting; programming physical fitness activities; an awards program for recognition of goal achievement; and public relations. The *Educational Kit: K-6* includes ideas for teaching fitness concepts through activity in grades kindergarten through six. These ideas, printed onto six by eight-inch cards, are divided into grades kindergarten through three (printed on one side), and grades four through six (printed on the reverse side of the card).

The *Feelin' Good* publications provide practical material to integrate fitness and fitness concepts with health and physical education. This 14-book series covers all grade levels and includes a publication for school administrators, parents, and the community. The Physical Best Software II (revision of original program), designed for students aged 5-18, generates 16 reports including: (1) Student Performance, (2) Goal Setting, (3) Recommended Activities for Improving Fitness, (4) Standards Met and Not Met, and (5) Awards Earned.

On an ongoing basis AAHPERD develops materials to supplement this comprehensive fitness education and assessment program. Several articles (McSwegin, 1989; McSwegin, Pemberton, & Petray, 1989; Pemberton & McSwegin, 1989; Petray, 1989a; Petray, 1989b; Petray, Blazer, Lavay, & Leeds, 1989); Petray & Cortese, 1988; Petray, Leeds, & Blazer, 1989) address the Physical Best program and provide guidelines for implementing physical fitness education and assessment into the physical education program.

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Integrating Physical Best into Other Elementary School Subjects

The physical educator should work with appropriate school personnel to assure that physical education is promoted schoolwide and that appropriate physical fitness concepts are integrated into other school subjects. A Physical Fitness Committee composed of the principal, school nurse, counselor, food service personnel, science and health specialists, classroom teacher, librarian, and parents should be established to coordinate the teaching of physical fitness concepts.

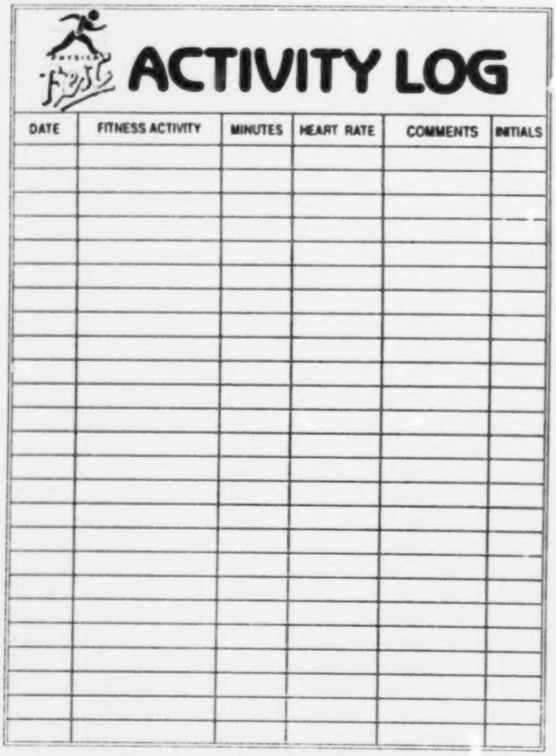
The Physical Fitness Committee can use the Physical Best program when selecting fitness concepts appropriate for teaching in a variety of subject areas. The Physical Best *Educational Kit: K-6* identifies specific physical fitness concepts related to the components of flexibility, aerobic endurance, body composition, and muscular strength and endurance; these concepts can easily be integrated into other school subjects. For example, one aerobics endurance concept for grades four through six is titled: "How Aerobic Endurance Relates to Health." The concept (Section II, 4-6) reads:

> Aerobic endurance increases your stroke volume (the amount of blood your heart pumps per beat), assists in keeping your blood vessels more elastic (than for those who do not exercise), delivers oxygen to the muscles more efficiently, and helps you to feel well and have lots of energy.

This concept can easily be incorporated into a health education lesson about the heart and lungs. It can also be included as part of a science lesson on simple anatomy and physiology.

Using the Physical Best *Educational Kit: K-6*, the school Physical Fitness Committee can develop a yearly plan for teaching physical fitness concepts. A yearly plan ensures that essential fitness concepts are taught in an organized sequence and that the various personnel are complementing each other in their teaching of the concepts.

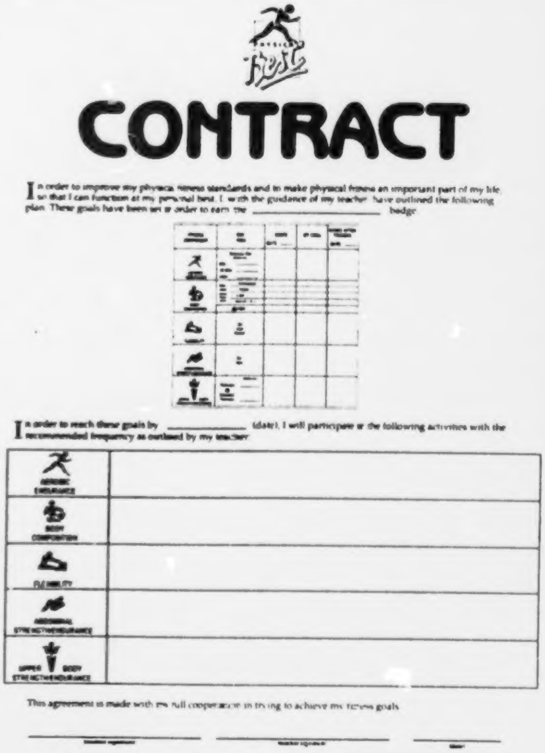
Another approach for promoting the physical education program through the schoolwide integration of physical fitness is the use of bulletin boards to illustrate specific fitness concepts. The Physical Fitness Committee can designate bulletin boards in the school office, library, cafeteria, multipurpose room, nurse's office, and appropriate classrooms, as "physical fitness"



ACTIVITY LOG

DATE	FITNESS ACTIVITY	MINUTES	HEART RATE	COMMENTS	INITIALS

Figure 1. Physical Best Activity Log



CONTRACT

In order to improve my physical fitness standards and to make physical fitness an important part of my life so that I can function at my personal best, I with the guidance of my teacher have outlined the following plan. These goals have been set in order to earn the ________________ badge.

In order to reach these goals by ____________ (date), I will participate in the following activities with the recommended frequency as outlined by my teacher.

This agreement is made with my full cooperation in trying to achieve my fitness goals.

Figure 2. Physical Best Goal Setting Contract

bulletin boards. Using a yearly plan, the content of the bulletin boards can be coordinated to teach and to reinforce specific fitness concepts. Additional materials can be used to integrate physical fitness into school subjects other than physical education. Physical Best includes an Activity Log, shown in figure 1, on which students record their physical activity on a daily basis. Writing in the Activity Logs can be part of an English assignment.

Physical Best also includes a Goal Setting Contract, shown in figure 2, to be used by students to set personal fitness goals. Goal setting can be part of a health education lesson on the topic of personal fitness.

Integrating the teaching of physical fitness concepts into the elementary school curriculum requires careful planning by the school Physical Fitness Committee. Coordinating the teaching of physical fitness concepts will ensure that the essential concepts are taught and reinforced in an organized sequential manner and that physical education is promoted on a schoolwide basis.

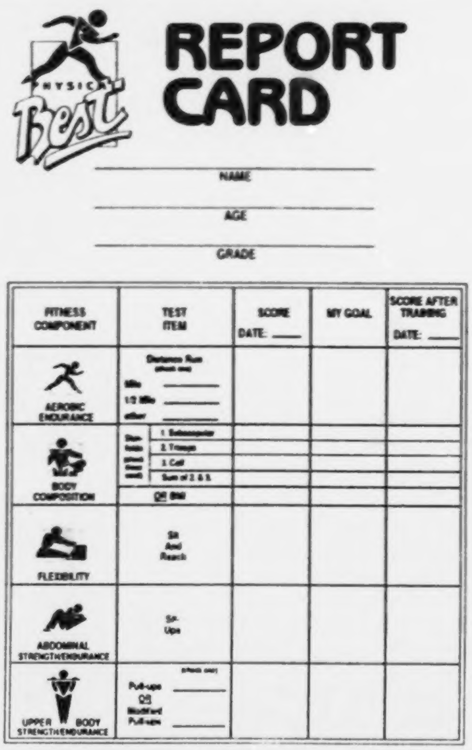
Promoting Physical Education in the Family and in the Community

Promoting the physical education program outside the school setting is essential if teachers are to expect administrative and community support. Few parents and community members understand that physical education emphasizes educating for involvement in a lifetime of activity. The following elements can be valuable public relations tools:

1. Physical Best includes procedures for incorporating routines and exercises for developing the five fitness components into the physical education program. These training activities provide positive fitness experiences for all students. Parents, administrators, and school board members can be invited to observe and participate in the fitness training activities during the school day. A Physical Fitness Night can be held during which students perform fitness routines and exercises.

2. Physical Best includes physical fitness testing at the beginning, middle, and end of the school year. One purpose of the testing is to make students aware of their own fitness status and to assist them in setting realistic goals. Parents, administrators, school board members, and other community leaders can be invited to observe the testing. These adults can also be trained to administer the tests and can serve as testing assistants.

3. The Physical Best goal-setting contract assists students in setting personal physical fitness goals. This contract can be sent home to inform parents of their child's goals and to make parents aware that the physical education program focuses on each student's personal fitness rather than group competition or comparison among students.



PHYSICAL Best

REPORT CARD

NAME

AGE

GRADE

FITNESS COMPONENT	TEST ITEM		SCORE DATE: ____	MY GOAL	SCORE AFTER TRAINING DATE: ____
AEROBIC ENDURANCE	Distance Run Mile ____ 1/2 Mile ____ other ____				
BODY COMPOSITION	[illegible]	1. Subscapular			
		2. Triceps			
		3. Calf			
		Sum of 2 & 3			
	OR BMI				
FLEXIBILITY	Sit And Reach				
ABDOMINAL STRENGTH/ENDURANCE	Sit-Ups				
UPPER BODY STRENGTH/ENDURANCE	Pull-ups ____ OR Modified Pull-ups ____				

Figure 3. Physical Best Report Card

4. Physical Best includes a report card (figure 3) which can be sent home to parents. The report card has space for recording a child's pretest scores on each physical fitness test, his/her individual goals, and his/her posttest scores. The Physical Best computer program provides an individual printout of fitness test results for each child which can also be used as a report card.

5. The awards system can be used to recognize the achievement of fitness goals by students. Physical Best includes recognition in three areas: (a) participation in appropriate fitness activity outside the school setting, (b) achievement of personal fitness goals, and (c) attainment of the health fitness standards (criterion referenced). Badges which recognize students' accomplishments in these three areas can be presented at a Physical Fitness Night attended by parents, school board members, and other community leaders.

6. A sample letter to parents emphasizes the importance of physical fitness and describes the Physical Best program. This letter, which can be modified for each school, serves both to inform and to educate parents.

7. Physical Best promotes vigorous physical activity outside the school setting. When assigning extracurricular activity, the physical educator can involve parents by requiring parent signatures on their child's activity log.

8. The Physical Best *Educational Kit: K-6* can be used to develop a booklet for parents on youth fitness. One such booklet has been developed by Petray and Blazer (1987).

9. The Physical Best program includes important fitness concepts which can be included in a Fitness Newsletter sent home on a regular basis.

10. Activities related to the Physical Best program can be publicized in bulletin board displays in public libraries throughout the community. Pictures of students participating in physical fitness training activities and testing can be used to inform and educate the community about the physical education program.

11. The Physical Best program can be presented at a Back-to-School Night or Open House. The Physical Best videotape or videos of children participating in various aspects of the program can be shown throughout the evening in a central location.

12. Presentations of Physical Best given at local service clubs will not only promote the program, but may also be useful in obtaining donations for needed materials and equipment.

The elementary physical educator can use the Physical Best program to promote physical education and to educate the public about the benefits of physical activity and its importance to lifetime health. If parents and community leaders believe that physical education is important, they are more likely to not only support, but demand, a quality physical education program.

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References

American Alliance for Health, Physical Education, Recreation, and Dance. (1989). *The Physical Best educational kit: K-6*. Reston, VA: Author.

Corbin, C. (1981). First things first, but don't stop there. *Journal of Physical Education, Recreation, and Dance (JOPERD)*, 52(36), 38.

Corbin, C. (1987). Physical fitness in the K-12 curriculum: Some defensible solutions to perennial problems. *JOPERD*, 58(7), 49-54.

McSwegin, P., Pemberton, C., & Petray, C. (1989). Fitting in fitness: The educational plan. *JOPERD*, 60(1), 32-34.

Pemberton, C., & McSwegin, P. (1989). Fitting in fitness: Goal setting and motivation. *JOPERD*, 60(1), 39-41.

Petray, C. (1989a). Organizing physical fitness assessment for grades kindergarten through two: Strategies for the elementary physical education specialist. *JOPERD*, 60(6), 57-60.

Petray, C. (1989b). Classroom teachers as partners: Teaching health-related physical fitness. *JOPERD*, 60(7), 64-66.

Petray, C., & Blazer, S. (1987). *Health related physical fitness: Concepts and activities for elementary school children* (2nd ed.). Edina, MN: Burgess International.

Petray, C., Blazer, S., Lavay, B., & Leeds, M. (1989). Fitting in fitness: Designing the fitness testing environment. *JOPERD*, 60(1), 35-38.

Petray, C., & Cortese, P. (1989). Physical fitness: A vital component of the school health curriculum. *Health Education*, 19(5), 4-7.

Petray, C., Leeds, M., & Blazer, S. (1989). Fitting in fitness: Programming for physical fitness. *JOPERD*, 60(1), 42-45.

Rollof, B. (1985). Public relations: Objectives for physical education. *JOPERD*, 56(3), 69-71.

Editor's note: In April 1992 the American Alliance for Health, Physical Education, Recreation and Dance entered into a memorandum of agreement with the President's Council on Physical Fitness and Sport to initiate one national physical fitness assessment and education program. The proposed President's Youth Fitness Program will feature the Physical Best test items and educational materials and the President's Challenge award system adapted to criterion-referenced standards. For current information about the program, contact AAHPERD.

Children and HIV/AIDS: A Role for Physical Educators and Recreation Professionals

AIDS in children has been a sensational but misunderstood issue. This article presents an overview of recent trends in pediatric HIV/AIDS and highlights several approaches physical educators and recreation professionals can use when working with HIV-infected children and their families.

M. Jean Keller

Acquired immunodeficiency syndrome (AIDS) in children has been a sensational but misunderstood issue. The public's fear and lack of knowledge about the disease have impeded efforts to understand and control the HIV/AIDS epidemic (Plotkin, 1987). This article presents an overview of recent trends in pediatric HIV/AIDS. Several approaches physical educators and recreation professionals can use when working with HIV-infected children and their families will be highlighted.

Magnitude of the Challenge

AIDS is one of the foremost health concerns in the United States. As of June 1991, 182,834 AIDS cases had been reported and of this number 3,140 cases involved infants and children under age 13 (Centers for Disease Control [CDC], 1991). The reported cases of pediatric AIDS severely underestimates the true scope of the problem. For every child who has been diagnosed with AIDS, another two to ten children are infected with the human immunodeficiency virus (HIV) (Association for the Care of Children's Health [ACCH], 1991). By the end of 1991, approximately 20,000 children in the United States may be infected (Chu et al, 1991).

Pediatric AIDS is particularly severe for minority children. African-American children constitute 15 percent of American children, while Latino children represent 10 percent; yet, this subpopulation accounts for 60 and 22 percent, respectively, of all childhood AIDS cases (ACCH, 1991). The life expectancy of a child born infected with the virus is not known. Children who show symptoms before age two have a poor prognosis, and many die within a year of diagnosis. Other children who do not become sick until age five or six, and with aggressive medical treatment, may live for an additional number of years (ACCH, 1991).

Pediatric AIDS and HIV

Health care providers have found that describing and detecting AIDS in children is more difficult than in adolescents and adults because AIDS in children must be differentiated from other congenital and immunodeficiency diseases (CDC, 1987). In children, the signs and symptoms of AIDS include failure to thrive, recurrent bacterial infections such as inner ear infections, chronic interstitial pneumonitis, thrush, and lymphadenopathy (Rogers, 1985; Shannon & Animann, 1985). Because chronic inflammations and infections make eating difficult, children with AIDS may not obtain adequate nutrition. They may experience weight loss, chronic diarrhea, shortness of breath, fatigue, and impaired growth. Neurological involvement frequently leads to cognitive impairment, regression in development, or a delay in the achievement of developmental milestones. For example, children may regress signifi-

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cantly, stop feeding themselves, or stop walking and resort to crawling (Oleske, 1987; Rogers et al., 1987; Scott, 1987).

AIDS is only one of the many manifestations of HIV infection. HIV-infected children may be completely asymptomatic, suffer growth and development retardation, and experience damaged skin, brain, heart, kidneys, and other organs, but they may never develop AIDS (Plotkin, 1987). An estimated 93 percent of children with HIV infection suffer developmental disabilities that result in some degree of mental and/or physical impairment (ACCH, 1991).

Although HIV/AIDS can afflict children at all levels of society, pediatric HIV infection is occurring disproportionately among children who have the least capacity and resources to cope (Lockhart & Wodarski, 1989). The majority of African-American children (62%) with AIDS have at least one parent who is diagnosed with AIDS (Guinan & Hardy, 1987). According to Rogers et al. (1987), perinatal transmission can occur at prenatal, intrapartum, and postpartum (e.g., breast-feeding) stages. Pediatric infections stem largely from mothers who are intravenous drug users or whose sexual partners either abuse drugs or are bisexual. Nearly 65 percent of babies born to infected mothers will contract AIDS (Koop, 1987).

Psychosocial Impact of AIDS on Children

While the physical impact of HIV/AIDS on children can be devastating, these children must also struggle and contend with social isolation, rejection, anxiety, depression, chronic illnesses, boredom, low self-esteem, loss of family support, delayed development, and the uncertainty of the illness (National Institute of Mental Health, 1986). Children with AIDS and HIV infection may also experience stress, loss of affect, anger, pain, helplessness, and guilt. They may interpret pain as punishment, attribute illness to recent family interactions, and blame themselves or other family members for causing the disease (Lockhart & Wodarski, 1989). These distorted perceptions may be perpetuated by children's reluctance to ask questions.

AIDS/HIV in children is a family issue. The illness of a family member upsets all aspects of family life—social roles, economic functioning, familial relationships, parenting, and leisure. Families with AIDS may experience multiple deaths, public condemnation, and withdrawal by others of empathic support, at a time when it is most needed. Upon hospitalization, children with AIDS/HIV infection may experience separation from family and friends. The loss of parents and placement in foster or adoptive homes involves medical, legal, ethical, confidential, emotional, and psychosocial issues (Lockhart & Wodarski, 1989).

While there is no cure for AIDS or HIV infection, recreation and leisure experiences may help alleviate some of the familial stresses associated with these illnesses.

A Role for Physical Educators and Recreation Professionals

The AIDS/HIV epidemic has many implications for recreation professionals and physical eduators working with children because the early years are critical to growth and development. Children primarily learn and grow through play and related experiences (Chance, 1979). Since most children with HIV infection will not be institutionalized and will remain in their local communities, physical educators and recreation professionals are challenged to discover opportunities which promote development and well-being within these children.

According to the Task Force on Pediatric AIDS, HIV-infected children who are old enough to attend school can be admitted freely to all activities, to the extent that their health permits (Plotkin, 1987). As with any other special population, there is no right activity, technique, program, or experience for children with AIDS or related illnesses. Recreation and play activities and programs should be based on the various needs and interests of the children. These children need opportunities to learn coping and leisure skills that are appropriate to their health, cultural and ethnic background, family lifestyle, and psychosocial needs. Since a high percentage of the children with AIDS/HIV are of ethnic/racial minority origin, physical educators and recreation professionals should be sensitive to language, preferences, and customs when planning programs.

While physical conditions of children will vary, the incubation for AIDS in children has increased with each surveillance year since 1981, with the longest incubation exceeding seven years (Rogers et al., 1987). Physical exercises, aquatic activities, sports, and games, contingent on the individual condition of each child, may increase their strength, flexibility, endurance, and overall body condition throughout this incubation period (Keller & Turner, 1990-91). Thus, health and physical educators and recreation professionals may have more opportunities over extended periods to develop leisure skills and meet physical and psychosocial needs of children with AIDS and related illnesses than often assumed.

Recreation and leisure activities are frequently employed as intervention strategies to achieve psychosocial goals in chidlren with disabilities (Joswiak, 1989; Mosey, 1986). Opportunities to appropriately alleviate stress, anger, guilt, and helplessness may occur during periods of play (Mosey, 1986). Recreation professionals and physical educators can use a wide variety of modalities to release emotions in children (Lindquist, 1977). Songs, rhythm bands, drama, puppetry, drawing, dance, creative movement, story telling, exercise, sports, and games can be used to help these children meet their emotional and psychosocial needs (Butler, Gotts, & Quisenberry, 1978; Turner & Keller, 1988).

Children with AIDS/HIV may experience a profound need for unconditional love and human touch (Dunphy, 1987). Pet, equestrian, and horticultural experiences provide opportunities for a child's growth and development, as well as occasions for unconditional love. Laughter, excitement, and joy can ease a child's pain, irritability, and depression. Opportunities to experience nature, risk, and competitive activities help children challenge themselves while building positive self-concepts and relationships (Lindquist, 1977).

Children with AIDS/HIV may not be able to experience normal socialization (Belfer, 1986). Without proper socialization, these children may grow up in an uncertain, isolated, stigmatizing world (Lockhart & Wodarski, 1989). Children infected with HIV may develop lowered self-esteems or maladaptive defenses to deal with the lack of socialization if opportunities for meaningful interaction with other children and adults are not offered. Physical educators and recreation professionals should consistently use a systematic procedure for analysing and selecting appropriate activities based on children's social needs, interests, and abilities.

Activity analysis is a process and procedure for breaking down and examining an activity to find inherent characteristics so that better programming decisions can be made (Peterson & Gunn, 1984). Activity analysis not only makes it possible to select appropriate activities and experiences for children with AIDS/HIV in schools and recreation agencies but facilitates proper sequencing, modification, and adaptation of programs and activities.

Leisure Education

Leisure education is a broad category of services that focus on developing and acquiring leisure-related skills, attitudes, and knowledge. Leisure education groups can be created with families and children with AIDS/HIV to explore leisure attitudes and values; raise and answer questions which may build understanding and acceptance; develop and maintain meaningful personal relationships with each other, as well as others; and demonstrate leisure resources and teach leisure skills appropriate to children's and families' abilities and lifestyles (Peterson & Gunn, 1984; Joswiak, 1989). Leisure education can be delivered in small groups which offer families and children support from others in similar situations. Lockhart and Wodarski (1989) indicated that professionals working with HIV-infected children and their families must help them express their emotions in a nonthreatening manner. Leisure education groups offer a supportive environment, where children and families share the responsibilityand rewards for learning about their leisure time interests and exploring the role leisure can play in their lives.

Leisure education may be based on a normalization concept. A leisure education program may be an ideal place to institute integration programs. Children and family members are heterogeneous as are those with AIDS-related illnesses. Care must be taken to carefully identify professionals and participants (children with and without HIV infection and respective family members) who will participate in an integrated leisure education program to promote a successful experience for all (Keller & Turner, 1990-91). Physical educators, recreation professionals, children, and family members must be prepared for integration to educate people and dissolve the fears and stereotypes that exist.

While resources are limited, the needs of children and families affected by AIDS-related illnesses will not go away quicky. Both physical educators and recreation professionals are encouraged to develop interagency and cooperative programs and services to address the leisure needs of families and children with AIDS-related illnesses while maximizing resources. Recreation professionals and physical educators must identify the unique concerns of specific ethnic and racial minority groups, determine the efficacy of intervention methods, improve service delivery systems, and establish service and practice requirements for professionals and programs.

These significant professional obligations and commitments have not yet been addressed. Continuous questioning, critical thinking, and followup action are essential as physical educators and recreation professionals are challenged to define and accept their roles in dealing with children who are HIV-infected.

References

Association for the Care of Children's Health, (1991). *Commitment to caring: Families of children with HIV infection—What families are saying and facts about pediatric AIDS*. Washington, DC: Author.

Belfer, J.L. (1986). Psychological impact of AIDS on children. *Viewpoints*, 120, 2-29.

Butler, A.L., Gotts, E.E., & Quisenberry, N.L. (1987). *Play as development*. Columbus, OH: Charles E. Merrill Publishing Company.

Centers for Disease Control. (1987, April 24). Classification systemfor human immunodeficiency virus (HIV) infection in children under 13 years of age. *Morbidity and Mortality Weekly Report*, 36(15), 225-235.

Centers for Disease Control. (1991, June). *HIV/AIDS surveillance report*. Atlanta, GA: Author.

Chance, P. (1979). *Learning through play*. New York: Gardner Press, Inc.

Chu, S.Y., Buehler, J.W., Oxtoby, M.J., & Kilbourne, B.W. (1991). Impact of the human immunodeficiency virus epidemic on mortality in children, United States. *Pediatrics*, 87(6), 806-810.

Dunphy, R. (1987). Helping persons with AIDS find meaning and hope. *Health Progress*, 68(4), 58-63.

Guinan, M.E., & Hardy, A. (1987). Epidemiology of AIDS in women in the United States: 1981 through 1986. *Journal of the American Medical Association*, 257(15), 2039-2042.

Joswiak, K. (1989). *Leisure education*. State College, PA: Venture Publishing.

Keller, M.J. & Turner, N.H. (1990-91). Children with AIDS and related illnesses: The role of therapeutic recreation with this terminal illness. *Leisure Information Quarterly*, 16(4), 7-9.

Koop, C.E. (1987). Excerpt from keynote address. In B. Silverman & A. Waddell (Eds.), *Report of the Surgeon General's workshop on children with HIV infection and their families* (pp. 3-5). Washington, DC: U.S. Department of Health and Human Services, Public Health Service.

Lindquist, I. (1977). *Therapy through play*. London: Arlingon Books, Ltd.

Lockhart, L.L., & Wodarski, J.S. (1989). Facing the unknown: Children and adolescents with AIDS. *Journal of Social Work*, 34, 215-221.

Mosey, A.C. (1986). *Activities therapy*. New York: Raven Press.

National Institute of Mental Health. (1986). *Coping with AIDS: Psychological and social considerations in helping people with HTLV-III infection*. Rockville, MD: Author.

Oleske, J. (1987). Natural history of HIV infection II. In K.B. Silverman & A. Waddell (Eds.), *Report of the Surgeon General's workshop on children with HIV infection and their families* (pp. 24-25). Washington, DC: U.S. Department of Health and Human Services, Public Health Service.

Peterson, C.A., & Gunn, S.L. (1984). *Therapeutic recreation program design*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Plotkin, S.A. (1987). Introduction. In K.B. Silverman & A. Waddell (Eds.), *Report of the Surgeon General's workshop on children with HIV infection and their families* (pp. 1-2). Washington, DC: U.S. Department of Health and Human Services, Public Health Service.

Rogers, M.F. (1985). AIDS in children: A review of the clinical epidemiologic and public health aspects. *Pediatric Infectious Diseases*, 4, 230-236.

Rogers, M.F. (1987). Transmission of the human immunodeficiency virus infection in the United States. In K.B. Silverman & A. Waddell (Eds.), *Report of the Surgeon General's workshop on children with HIV infection and their families* (pp. 17-19). Washington, DC: U.S. Department of Health and Human Services, Public Health Service.

Rogers, M.F., Thomas, P.A., Starcher, E.T., Noa, M.C., Bush, T.J., & Jaffe, H.W. (1987). Acquired immunodeficiency syndrome in children: Report of the Centers for Disease Control national surveillance, 1982-1985. *Pediatrics*, 79(6), 1008-1014.

Scott, G.B. (1987). Natural history of HIV infection I. In K.B. Silverman & A. Waddell (Eds.), *Report of the Surgeon General's workshop on children with HIV infection and their families* (pp. 22-23). Washington, DC: U.S. Department of Health and Human Services, Public Health Service.

Shannon, K.M. & Animann, A.G. (1985). Acquired immune deficiency syndrome in childhood. *Journal of Pediatrics*, 106, 332-342.

Turner, N.H. & Keller, M.J. (1988). Therapeutic recreation practitioners' involvement in the AIDS epidemic. *Therapeutic Recreation Journal*, 22(3), 12-22.

Pedagogical Considerations

Weiss and Bressan open this section with a proposed framework for an instructional theory in physical education. The next nine articles offer suggestions for professional practice with the goal of improving instruction in children's physical education. The section concludes with a discussion of the issue of evaluating children as movers.

Connections: Relating Instructional Theory to Children's Psychosocial Development

The optimal challenge model uses observation, teacher behavior, and personal reflection to educate the child cognitively and affectively.

Maureen R. Weiss
Elizabeth S. Bressan

The outcomes of physical education usually are stated in terms of motor, cognitive, and affective objectives assumed to be available by participation in quality programs. While research has provided substantial information to assist teachers in setting motor skill objectives and designing learning experiences to help children meet them, there is less information available on cognitive learning in physical education. Consequently, cognitive objectives in physical education are not dealt with in the depth that most teachers would like. However, it is with the affective objectives that the biggest breakdown seems to occur. We valiantly wave a flag of "social and emotional growth" in our statements about the contributions physical education can make to the "whole child," yet we remain naive about the processes of psychosocial development that underlie such growth, and fundamentally ignorant about formal teaching behaviors that could be used to support and facilitate children's progress.

If we maintain that affective objectives are both desirable and attainable through physical education, we must gain an understanding of psychosocial development and begin to identify how we, as teachers, can structure physical education experiences to influence children in positive ways. Social psychology of sport and motor behavior offers an excellent starting place for theoretically grounded strategies to build social and emotional development through physical education. Unfortunately, a large body of the research in this area may seem a bit abstract or even irrelevant to many teachers. Gould (1982) recommended three criteria for locating research that may have practical applications for teachers: (1) the question posed in the study should address a practical problem; (2) the study should integrate previous research or offer a new theory to explain relationship among the variables under investigation; and (3) the study should be one in a series of studies by the researcher, rather than a single, isolated publication.

The key to establishing the credibility of physical education as an area where psychosocial development is formally addressed is found in linking an academic understanding of that development to an instructional theory that incorporates responsible professional practices. Effective instruction is not well understood. The bulk of recent research on instruction has focused on only one aspect — teacher behavior. Yet instruction is

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more than that. Barrett (1977) provided a helpful conceptualization of the process of instruction: she sees it as a dynamic interaction of observation, teacher behavior, and reflection. From an initial acceptance of these three instructional processes, we drew the framework for an instructional theory for physical education that allowed us to integrate some exciting new directions in research on children's psychosocial development (Bressan & Weiss, 1982).

The proposed framework for instruction was a modification and extension of the pioneer efforts of Griffin and Keogh (1982), two physical educators who proposed a model of "movement confidence" based on integration of Bandura's (1977) self-efficacy theory and Harter's (1978) competence motivation theory. We were able to suggest a complementary cycle of instruction to promote positive experiences within physical activity. Each of the instructional processes identified by Barrett was elaborated based upon a review of current research on instruction. This framework focuses on the development of children's competence, self-confidence, and persistence in sport, dance, and exercise participation.

The central process within this model is observation. Teachers cannot interpret or deal with dimensions of performance they cannot see. A comprehensive physical education program that incorporates affective objectives demands that teachers be able to observe signs of children's confidence and persistence, as well as their actual competence. Observing for competence requires a focus of attention on children's ability to handle the motor, fitness, and cognitive demands of an activity. Observing for confidence, on the other hand, requires a focus on children's *feelings* about their perceived ability to meet the challenges at hand and their *anticipation* of pleasant or unpleasant sensations in moving. Observing for confidence was a major concern in a series of papers by Griffin and Keogh, and it is an area within observation that cries for further study. Observing for persistence is similar to what Siedentop (1976) described as children's on-task behavior. This includes such techniques as observing whether or not children can sustain participation under varying circumstances, such as when task cards are used rather than direct leadership by a teacher.

Observing for competence, confidence, and persistence gives teachers three sources of information on which to base their instructional decisions. Two of these dimensions, confidence and persistence, are psychosocial. As the second instructional process, teacher behavior, is considered, some effort must be made to incorporate this information. If teaching behavior is defined as either modifying task difficulty or modifying the degree and type of education support provided to the child, then task difficulty can be considered a function of the motor, fitness, and cognitive challenge in participation (challenge to competence); and educational support may be seen as psychosocial-related strategies as they relate to the challenge to children's confidence and persistence.

Deciding what degree and type of educational support to provide to children in a given setting must be based on information gathered during observation. Teachers can then make choices about their own behavior that are designed to promote children's self-confidence in moving. Possible types of educational support include:

- helping the children set goals for their own performance
- reinforcing children's effort and persistence in working on their skill development
- emphasizing what children are doing correctly, rather than dwelling on what is being done incorrectly
- catching children doing things correctly and conveying this to them
- carefully selecting the style of teaching that will allow children maximum involvement in decision making, yet still provide adequate structure for safe participation and efficient use of practice time.

Teachers can use these forms of educational support in varying degrees of intensity and frequency. Children lacking confidence would require more active support from the teacher, while children gaining confidence would require progressively less support.

When teachers design learning experiences using decisions about task difficulty and educational support based upon observations of current levels of capability, and when those decisions are made with the intention of helping children gain self-confidence in moving, then physical education teaching can be said to be following an optimal challenge model. In such a model, activities are modified to "fit" the needs of children; children are not manipulated to "fit" into activities. This fundamental premise about the intention of teaching is central to any model of instruction that targets the meeting of affective objectives associated with positive psychosocial development.

The third instructional process within this model is personal reflection. Teachers, it is suggested, must think about what they are doing and why they are doing it if they aspire to be professionals. Personal reflection is self-assessment ... are we doing all we can do to make the physical education experience right for children?

Are there things about our teaching behavior that need to change? Are there things about our model of instruction that need to change? Barrett (1977), in "reflection," provided some possible exercises that could help initiate such self-assessment.

- ask questions about your own performance — focus your attention on your behavior rather than always looking at the children's
- try to make some notes about how you think your teaching or your program is going; reread these at a later date to get a feeling for your progress
- join, as a participant, in some of the activities you plan for children; ask another teacher to deliver your lesson and see if it is truly centered on competence, confidence, and persistence.

When physical educators are able to incorporate motor, cognitive, and affective dimensions into their instruction, then and only then can credibility be established for claims about educating the "whole child." The optimal challenge model is now being tested in applied public school settings to determine its potential as an overall design for instruction in physical education. Because two aspects of psychosocial development (confidence and persistence) are explicitly targeted for observation, decisions about teacher behavior, and reflection, the optimal challenge model is being compared to other approaches of instruction that do not directly address psychosocial development.

As data on children's competence in moving, level of confidence, and persistence is gathered, the relative strengths of the optimal challenge can be assessed. It is only after a series of studies of this type are completed that any definitive evaluation can be presented of the optimal challenge model. However, since there are no current instructional models available in physical education that have proven to be effective in promoting children's psychosocial development without sacrificing children's motor skill acquisition, the optimal challenge model is at least a starting place for those teachers who believe that they may be able to achieve motor, cognitive, and affective objectives in responsibly designed and delivered programs. The search for an instructional model for physically educating the "whole child" continues. There are definite signs of effort; what is needed next are signs of progress.

References

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.

Barrett, K. (1977). Studying teaching — a means for becoming a more effective teacher. In B. Logsdon, K. Barrett, M. Ammons, M. Broer, L. Halverson, R. McGee, & M.A. Roberton, *Physical education for children*. Philadelphia: Lea and Febiger, 249-287.

Bressan, E., & Weiss, M. (1982). A theory of instruction for developing competence, self-confidence, and persistence in physical education. *Journal of Teaching in Physical Education*, 38-47.

Gould, D. (1982). Sport psychology in the 1980's: Status, direction, and challenge in youth sports research. *Journal of Sport Psychology*, 4(3), 203-218.

Griffin, N.S., & Keogh, J. (1982). A model for movement confidence. In J.A.S. Kelso and J.E. Clark (Eds.), *The development of movement control and coordination*. New York: Wiley.

Harter, S. (1978). Effective motivation reconsidered. *Human Development*, 21, 34-64.

Siedentop, D. (1976). Self-control. In *Personalized learning in physical education* (pp. 44-54). Washington, DC: AAHPERD.

Educational Gymnastics Is for Everyone

Andrea Boucher

If gymnastics is to be for everyone, including the handicapped child, then all children can not be asked to do the same gymnastic movement at the same time, in exactly the same way, for clearly some children are going to be underchallenged and some are going to be overchallenged. With the passage of Public Law 94-142, it is mandatory that regular school physical education programs be appropriate for handicapped individuals too.

Movement and Learning

Knowledge regarding development and learning has been partly responsible for the development of educational gymnastics programs, for they are individualized programs. Handicapped children who can benefit from a regular public school setting can be readily integrated or mainstreamed into a gymnastics program, for it caters to all levels of ability. The use of problem-solving movement tasks makes this possible. There is always more than one movement answer possible to any such task. This freedom and choice affords all children the opportunity to choose that which is appropriate to their developmental level.

Physical Literacy a Priority Need

We must not lose sight of what movement means for learning. Children are deprived of learning opportunities when their movement is not normal. This is so with many physically handicapped children.

Physical therapists are excited about the possibilities of educational gymnastic school programs for their patients, particularly those with normal intelligence. Movement is a priority need for such children. They need to use their bodies in new and different and more challenging ways. Their "movement vocabularies" are often very deficient. Just as schools foster the individual development of word vocabularies which students understand, use, and write, so it is just as important that children be physically literate with movement vocabularies which are constantly being expanded. Certainly an objective of educational gymnastics is the mastery and refinement of new body management skills, whether the child be mentally retarded, emotionally disturbed, socially maladjusted, deaf, visually impaired, physically handicapped, or with some degree of neuromotor impairment.

Teaching Methods

In educational gymnastics a variety of teaching methods are used. Sometimes the teacher will give total direction and no freedom to the children. This is recognized as the traditional method, or authoritarian style, command style, or direct teaching method. It tends to be used for individual children rather than whole classes of children. If this method is at one end of a continuum, at the other end would fall a method where no direction is

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given by the teacher and thus the children have total freedom (laissez-faire, free exploration, discovery, indirect).

Both of these extremes have their place in this program but most of the time the teacher gives varying degrees of direction and choice. Bilbrough and Jones refer to this as the limitation method of teaching because different limits are set at different points in a lesson and the children must work within these limits.

The limits chosen by the teacher are determined at varied intervals during a lesson and are based on what the teacher observes the children doing, i.e., the variety of movements being worked on, quality of such movements, and self-control and behavior generally will also determine whether children can handle more or less freedom.

No textbook, college professor, or supervisor can tell a teacher what to do or when to do it. The teacher must be sensitive to the individual needs and behavior of the group. Each group will differ and the same group will behave differently from lesson to lesson.

Thus, I suggest making a rough plan, with the teacher being prepared to slow down, speed up, or omit, or add to it as the need arises. This fluid, dynamic way of teaching is not easy. To be successful teachers need to be trained to observe movement behavior and social interactions in a detailed and skillful manner. This often necessitates beginning with a small group rather than a large class.

In training teachers, I have found the model shown below to be a useful aid in replacing the pages of skills and their set progressions that traditionally appear in physical education tests. Each stage does not have to be completed with all skills before moving to the next. Rather, it serves as a directional guide as the teacher plans tasks for the children.

Young children and others with little varied movement experience would be given tasks which have as their focus simple exploration of what their body can do by itself, or what it can do on different pieces of apparatus. Examples of tasks for Stage 1 might be:

> FLOOR: "Move yourself around this space without touching anyone else. Don't walk or run."
> APPARATUS: "Experiment with different kinds of movements on the bars, boxes, mats, etc. Try to have a turn on each piece in the room."

Both of these tasks would be appropriate for children with a variety of handicaps. The physically handicapped child who is nonambulatory, or the visually impaired child, can choose movements which are appropriate to his/her ability as well as choosing apparatus which is perhaps lower to the ground and thus safer.

Following the introduction of exploratory-type tasks, I would move to tasks which guide the child in his/her attempts to vary different gymnastic movements. Sometimes both types of tasks would be given in the same lesson, or maybe in consecutive or subsequent lessons.

Examples of tasks for Stage 2 would be:

> FLOOR: "How many different ways can you travel on your hands and feet." "As you travel sometimes have feet together and sometimes apart." (Note the focus for thinking and experimenting is on varying traveling on specific parts of the body, namely hands and feet and then just feet.)

Model for Structuring the Gymnastics Program

Much movement experience	Stage 4 SEQUENCE	REPETITION
	Stage 3 COMBINATION	INCREASES & DECREASES IN DIFFICULTY
	Stage 2 VARIATION	SELECTION
Little movement experience	Stage 1 EXPLORATION	by both teacher and/or child in every stage

OR
"Try movements where you travel *backwards* and *sideways* through space." (Note the focus is now on varying the direction of the movement in space.)
APPARATUS: "Find different places and ways to *hang* or *swing* on the apparatus." (Note the focus is on various hanging or swinging-type movements.)

OR
"Try *balances* using *different parts of your body* to support you on different pieces of apparatus." (Note variation of balance positions is the focus.)

Children will develop varied, versatile, and skilled movement if adequate time is spent on tasks/movement problems which aim at guiding the learner to thoroughly explore different movements on the floor and on different pieces of apparatus. Children will produce many interesting and unusual variations of movements of all kinds if given the time to explore and work on variations. It is not appropriate to outline a hierarchy of movements, or which movement variables or pieces of apparatus to explore, or in what order they should be presented. This will depend on many factors, e.g., the interest of the children, their body control and level of skill for different movements, their past experience with different pieces of apparatus, the availability of apparatus in the school, their confidence, their ability to use their own ideas, etc.

As children move in a more varied and difficult manner, they extend their movement repertoires, and it is appropriate to introduce tasks/problems that are more complex, and more demanding of higher level thinking and moving and greater body control. Such as the case when children are asked to combine movements or when two children cooperate and work together. The natural development from this stage then is to create sequences of movements which vary in length and difficulty according to the ability of the movers and their stamina. Clearly the complexity and language used in these tasks would not be appropriate for mentally retarded individuals. For many of the emotionally disturbed and socially maladjusted, it may depend on the mood for the day. Many physically handicapped children with no other impairments can work at this stage quite capably.

Examples of tasks for Stage 3 would be:

FLOOR: "Experiment with combinations of *rocking* and *rolling* on different body parts. Work for smoothness in the movements." (Note the children are guided to combine two different types of movements, viz., rocking with rolling.)
OR
"Practice *rolling* out of different *balance positions*. Include inverted or upside-down balances if you can."

OR
"Work on *balances* with a *partner* where part or all of your body weight is supported by one person." (Note this demands more strength and skill, and more knowledge of where the body is in space. Such tasks can be explored more fully by the mover with experience.)
APPARATUS: "Discover four ways to *mount* (or get on) and *dismount* (or get off) a piece of apparatus of your choice. *Practice* them to improve your control." (Note the focus is practicing mounting/dismounting in just four ways, not many ways.)

OR
"Combine *jumps* and *rolls* but vary the *direction* and *shape* of each." (Note the amount of thinking which is now involved. The mover must keep in mind two kinds of movements and two movement variables for each.)

Examples of tasks at Stage 4 would be:

FLOOR: "Invent a *sequence* of movement which includes different jumps, balances and rolls. Establish a clear beginning and ending. Repeat it."

OR
"Construct a *movement sentence* consisting of traveling with turning and twisting and stretched and bent balances. Show variations of *speed* in this sentence."
APPARATUS: "Select one piece of apparatus and make up a short routine which involves *symmetrical* and *asymmetrical* movements."

OR
"Continuously move on, over, and between three pieces of apparatus. Decide on a combination of movements which interests and challenges you and try to improve the quality of these combined movements."

Now to the section of the model dealing with "Repetition," "Increases/Decreases in Difficulty," and "Selection." These three elements affect every stage of a program. The teacher may plan for these things or the child might do them naturally without suggestion from the teacher. Repetition is necessary for the refinement of all skills. It makes performance more automatic, quicker, smoother, and requiring less effort. If it is insufficient, then the teacher can fill the gap by structuring a task which has a repetition as a focus.

In traditional gymnastics the teacher decides when and how the difficulty of a movement will be increased. Most normal children, however, will also quite spontaneously make movements more difficult for themselves, if they feel ready for the extra challenge. Most also have ideas of how to decrease the difficulty of movements. If in the teacher's judgment a child needs help then the teacher's role becomes one of suggesting ways to alter the difficulty. This is particularly so in the case of many mentally retarded children, who tend to persevere on the same movement if not asked or forced to change. Children lacking confidence in their own ability will often need constant encouragement to try more difficult movements. We also have some children who need to be continually cautioned about trying movements which are above their level of functioning.

Most nonhandicapped children will, over time, select and practice a wide variety of movements on the floor and apparatus in response to the movement problems set by the teacher. If a teacher finds certain movements are being avoided for whatever reason, then he/she can fill the void by structuring a task which focuses on that which is being avoided.

In educational gymnastics the teacher and child share the decision-making role. I believe that most children, given a chance, will eventually begin to make sensible decisions about their own learning. The severely mentally retarded child, of course, can not do this but certainly the mildly retarded or slow learner can make more minor decisions and should be allowed to do so when interest is shown.

If one follows such a model it should be clear that educational gymnastics is not a program where children are given total freedom to explore all the time. Neither is it a program where children constantly find "how many different ways" they can move. The teacher carefully plans the structure or amount of direction which is given the children, which results in varying degrees of freedom. The examples cited should also make it clear that the quality of each child's movement response is important. We should encourage children from a young age to always do movements as well as possible, e.g., soft, controlled landings from jumps, clear body shapes, full stretch to the tips of the toes, etc. The above examples should also indicate that this work need not cease at third grade. It is highly successful and challenging for university level students with a high degree of skill in gymnastics.

Lesson Planning

Each lesson usually involves movement work on the floor as well as work on apparatus. The amount of time spent on each depends on the group, but as a guide, I try to spend half and half. With children who have difficulty remembering tasks or who tend to be overactive, I sometimes find it beneficial to work on apparatus most of the time. If careful thought is given to the placement of the apparatus in the working space and the relationship of pieces to each other, this can do much to stimulate different movement ideas for some, while for others it helps slow down activity.

Small apparatus can add variety to floorwork and can serve as a focus for attention. I find this is necessary with many emotionally disturbed and socially maladjusted children. I might use hoops in this way. "Put the hoop on the ground and move in and out and around it." With a dowel and two traffic cones: "Set-up your equipment so that you can find ways to go under and/or over the dowel."

Most handicapped children do well on large apparatus providing it is varied and of different heights and combinations. There should also be sufficient apparatus to avoid crowding and lining up. With children who display social and emotional problems, I often begin with open-ended tasks like "Where would you like to work today?" Depending on the choice made and the type of movement initiated by the child, I then ask a question or make a comment which challenges the child further. For example, if a child initiated climbing to the top of the climbing frame I might say "Now could you go around as well?"

With some severely physically handicapped children, the teacher can position them in such a way that with just a little effort and the help of gravity, they can complete a movement themselves. Low benches, bars, tables, boxes, and foam shapes are useful for this purpose. Such pieces of apparatus lend themselves readily to the exploration of prepositional tasks, e.g., "Move under and over," "Get through," "Travel between."

With the mentally retarded individual the approach is different. Such children do not produce their own ideas readily. Detailed tasks which require thought and memorization are clearly inappropriate. Tasks must be brief and simply worded in order to be comprehended. Tasks with one point of focus are beneficial, e.g., "Come here," or "Get yourself to here." Both may be accompanied by gestures. Some other examples include "Jump," "Jump up high," or "Swing yourself," "Get up here — come down again," or "Move on hands and feet." I find it useful to physically handle some children and to use gestures, to help in the understanding of what is being suggested.

Repetition is necessary. Imitation is often necessary but with the goal of enabling the learner to repeat that movement in a new or different situation, e.g., on something, instead of on the floor. Depending on the part(s) of the body involved, many cerebral palsied children have a very satisfying experience in educational gymnastics using tasks at their mental level. Although they find jumping difficult or impossible because of the degree of body control required for take-off and landing and balancing oneself while airborne, we too often underestimate the movement potential of CP children.

Varied movement will result if the physical objects used for all children are of different sizes, shapes, surfaces, textures, heights, widths, and slopes. The method of negotiation, the type of movements and body positions used, and the speed of the movements, can often be left open to the children's discretion as they use such objects.

In-Depth Study of Educational Gymnastics Is Necessary

Teaching gymnastics in a way in which children are given varying degrees of freedom and choice is not easy for a teacher. Newly-trained teachers who have studied the movement education approach in several college courses often adapt readily and are successful. Most physical education training programs use predominantly traditional methods.

The added benefits which are derived from methods where children are given freedom and choice and where they are encouraged, if they are able, to use their own ideas and to create new and different movements with their bodies, must receive much more emphasis in professional training programs. I feel the abandonment of individualized gymnastics is due to a lack of in-depth knowledge regarding the developmental and philosophical basis of this work. Too many one-day, one-time workshops offer practical ideas of initiating educational gymnastic lessons, with little discussion related to why such changes in method and content are appropriate. Teachers return to their schools and try a few problem-solving tasks for a few lessons and then do not know how to proceed from there. Inadequate repetition is built into the program to ensure increases in skill. Often too many variables are introduced too soon before children have had a chance to fully explore a few of them.

In my opinion, if one wants to become a competent educational gymnastics teacher the first step is thorough study of the few excellent texts written by the pioneers of the work in England. These educators write with the benefit of years of experience and experimentation and with sound knowledge regarding child growth and development. Any teacher wanting to seriously study educational gymnastics should read the following texts.

Bilbrough, A., & Jones, P. *Physical Education in the Primary School.* London: University of London Press, 1963.

Cameron, W., & Pleasance, P. *Education in Movement.* Oxford: Basil Blackwell, 1964.

Mauldon, E., & Layson, J. *Teaching Gymnastics.* London: MacDonald and Evans, 1965.

Morison, Ruth. *A Movement Approach to EducationalGymnastics.* London: J.M. Dent & Sons, 1969.

I would hope, as more college professors become qualified, that educational gymnastics be offered as a course of study at the undergraduate and graduate levels. We have such a sixteen-week graduate course at Towson State University where both elementary and secondary specialist teachers study the development of this work for different levels of movement experience. Contrary to the belief of some, educational gymnastics is a challenging activity for all ages and levels of ability. Special education and classroom teachers, together with physical and occupational therapists, also study this work at our university and graduates have initiated some excellent individualized movement programs covering the whole spectrum from the severely handicapped to the highly skilled gymnast.

Let the Students Create the Games

Robert E. Kraft

Do you feel that your program has stagnated? Are your students complaining, "Do we have to play that again?" Are you interested in revitalizing the curriculum? Physical educators have a readily available resource to enrich the curriculum with fresh, innovative activities that are relevant to the students. That resource is the students. Add some excitement and challenge to your program by encouraging your students to create their own new, original games.

In using this approach, a problem solving method is applied to the development of new games. The resulting activities should be original, rather than simply a modification of an old game.

The Challenge

The instructor initiates the process by presenting a challenge. The challenge serves as a starting point for discussion and decision making. The challenge may express the purpose of the game, the motor skills involved, or the equipment to be used. Specific examples of challenges include:

- Create a new game in which each team attempts to get another team's objects, while defending their own objects (purpose).
- Create a new game using a target that involves running, throwing, and catching (motor skills).
- Create a new game that uses hoops, ropes, and volleyballs (equipment).

Editor's Note: This article appeared originally in the Professional Practice column of *Strategies* (Sep.-Oct. 1988), which presented ideas for working with students to develop creative new games. Robert Kraft of the University of Delaware outlines a problem-solving approach which challenges students' imaginations while providing structure for their creativity. This article will provide physical education and sport professionals with some ideas to begin tapping one of their best creative resources: the students.

The Structure

The role of the instructor is to provide a logical structure that organizes the creative processes of the students. The structure may include stipulations regarding any or all of the following:

- Purpose—what are the objectives and possible outcomes of the game?
- Grade level—for what age range is the game best suited?
- Motor skills—what skills are needed to play the game?
- Format—what kind of game is it? Is it a ball game? Is it a tag game?
- Number of players—what is the ideal number of students to play the game?

- Organization—what are the procedures, formations, and boundaries?
- Rules—what are the game penalties and restrictions?
- Scoring—how do the teams score? Is scoring necessary for the game?
- Equipment—what type and how much equipment is needed? Should each player have their own equipment?

Discussion

During the decision making process, the attitude of the instructor should be one of acceptance and approval. The students should be allowed to interact, create, and make mistakes, with the instructor interceding only when the direction of the game presents safety problems.

During the initial trials of playing the game, modifications usually are needed. The instructor may ask, "How can we increase the activity level and eliminate waiting time?" or "What skills need to be practiced to play the game better?" or "How can another skill be added to the game?" As the students continue to play the games, modifications of rules and game strategies can be developed.

Students will become more involved in a program when they feel a sense of ownership in the activities. The new games that become successful can be exchanged between teachers throughout the school district. Physical educators should not be reluctant to change the curriculum. Tap the rich resource of your students' imaginations. Take the risk and try it!

Teaching Ultimate Frisbee

Judith Cole

Are you tired of watching your upper-elementary students struggle to play basketball, flag football, or soccer? Are you concerned that games are too often dominated by just a few highly skilled, experienced children? Are you looking for a way to avoid frustration for the student whose psychomotor skills are still developing and whose understanding of offensive and defensive tactics is limited?

Why not try Ultimate Frisbee? This is a noncontact team game which combines the running and teamwork of soccer, the long passes and diving catches of football, and the zone and player to player defenses of basketball (Wellemeyer, 1984). It is a good alternative because students learn open-skill concepts on a level where each has a chance for success.

Why Ultimate?

- Ultimate offers an alternative to the more traditional team sports.
- Ultimate allows for individual skill development and creativity within the structure of a team sport.
- Ultimate provides a chance for early psychomotor success in a dynamic, changing environment.
- Ultimate's rules are simple and emphasize the spirit of fair play and honor.
- Ultimate provides an opportunity to advance a student's cognitive understanding of the aerodynamics of a flying disc and the mechanical principles involved in its manipulation.
- Ultimate can be played as a coeducational activity involving only a few participants or many.
- Ultimate can be played indoors or out.
- Ultimate adds to the list of possible lifetime participatory activities.
- The disc is inexpensive and durable.

The object of Ultimate is simply to move the frisbee down the field by passing and in turn to score by tossing to a teammate in the end zone. But what kinds of perceptual-motor movements and decisions are required to play Ultimate?

External Pace

First, the activity is externally paced. A player must be able to execute throwing or catching skills in a dynamic environment where conditions constantly are changing; those directly involved in the exchange of the disc perform in the midst of 12 other moving players.

Immediate Responses

Second, the game requires immediate responses. A player must make quick perceptual decisions based on whether the team is on offense or defense; where one is in relationship to others on the field; and the whereabouts of the flying disc. As with other sports involving a moving object, anticipation is a must if one is to cut successfully to an open space or move to cover a passing lane.

Variations

Third, the game calls for variations in speed, levels, and distances. It is essential that students be able to adapt their movements, to adjust to the foot speed of another player, and to the loft time of the disc. Students

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need to be able to catch or throw with either hand from inches off the ground to well above their heads. And they need to be able to send or receive the spinning disc from any distance, for example, lateral short passes, diagonal down-field passes, or curving intermediate passes.

Teaching Ultimate: Stage One

How should Ultimate be taught given its open-skill qualities? It can be taught according to Rink's (1985) four stages of games skills development. The four stages while not hierarchical are systematically designed to develop those skills necessary to compete in complex games.

Stage One is intended to develop those manipulative skills required to control the disc — throwing and catching. There are two kinds of throws: the backhand, which is executed across the chest; and the sidearm, which is executed from the lateral side of the body. There are two types of catches: the sandwich, in which one hand is placed on top of the disc and the other hand on the bottom; and the c-catch, which involves simply forming the letter "c" with the thumb and fingers and closing the hand around the disc.

To practice the mechanics of sending and receiving the frisbee, organized drills which allow for immediate success are helpful. Start with simple back and forth throwing and catching tasks, and then progress to tasks requiring changes in distances, levels, directionality, and applied force. Drills should begin between stationary sender/stationary receiver and progress to stationary sender/moving receiver. There is no need to practice throwing while on the move; according to the rules, players may only pivot while in possession of the disc.

Teaching Ultimate: Stage Two

Stage Two also deals with individual control of the disc, but under more complex conditions. In this stage, pivoting is worked on in combination with throwing. Students should be encouraged to try a wide range of deliveries while abiding by the pivot rule.

Much of the practice can be done in stations. For example, one station can practice timed yet controlled releases; one can practice throwing for accuracy, one for distance. Regardless of the station, the tasks must be performed while keeping the established pivot foot in contact with the ground.

Supplemental materials about the Hyzer Angle, gyroscopic stability, Lines of Headrick, and the ten phases of a disc's flight can be included in Stage Two (Gold, 1982). These mechanical explanations and demonstrations will complement the different throwing and catching process being practiced.

Teaching Ultimate: Stage Three

The third stage of Rink's games skills development strategy focuses on offensive and defensive tactics. The concerns become the temporal and spatial aspects of competitive play rather than skill development in various uncontested drill/station situations.

During Stage Three students learn the offensive tactics of throwing and catching the frisbee while being guarded plus how to cut to an open space. Practice situations should stress keeping the offense spread out, not getting too far ahead of the disc, and frequently changing passing directions.

During this stage students should learn how to defend against an opponent using player-to-player technique. Other defensive techniques should emphasize staying with the player, denying the pass, and being ready either to intercept or force a turnover. Ways of practicing these offensive and defensive tactics can include two-on-two and four-on-four situations. While the players on offense work on their advancement tactics, the players on defense work on their preventive and anticipatory behaviors.

Stage Three should also stress fouls and rules of possession. A team version of "Keep Away" can be used since its objectives are so similar to Ultimate. The lead up game helps to familiarize players with the honor system of calling one's own fouls and helps to establish the rules for maintaining possession of the disc.

The first time or two that "Keep Away" is played, encourage students to ask questions. They may disrupt the continuity of the game, but the time is well spent. Questions and answers will contribute to a better understanding of the objectives of the game and the interpretation of its rules. They will also refine team strategies for moving and maintaining possession of the disc.

Teaching Ultimate: Stage Four

Rink suggests Stage Four either can be one to modify the game if play is still not continuous, or it can focus on the full game if the level of individual skills is fairly high.

You may choose to play the game according to the official rules, placing particular emphasis on permitting only one defender per offensive player. During play students should be encouraged to call their own fouls and reinforced when they do so. In addition to rule-related matters, positioning should be stressed in all games. At the end of each class period give special

Ultimate Unit Plan—Grades 5-6

STAGE ONE	*Objective:*	Develop manipulative skills.
Precontrol Level	*Activities:*	Teacher demonstrates with student: • backhand throw • sidearm throw • sandwich catch • c-catch (1) throw and catch at different levels (2) catch on the move in all directions and with one or two hands (3) not move while throwing except to step into the throw (4) increase distance from one another after every 4 successful catches
STAGE TWO	*Objective:*	Refine techniques of exchanging the disc.
Control Level	*Activities:*	(1) Teacher supplements practice with explanation of flight mechanics of the disc. (2) Partners practice the throws and catches without traveling to assess accuracy and control. (3) Partners practice traveling the length of the field, running to catch; not running to throw. (4) Students practice pivoting to a whistle signal.
STAGE THREE	*Objective:*	Apply skills in practice lead-up drills and games. Introduce offensive and defensive strategies.
Utilization Level	*Activities:*	(1) Review pivot and throw, then add throwing ahead of a running receiver. (2) 2 v 1 "Keep Away." Add concept of cutting to an open space. (3) 2 v 2 "Captain Disc." Move disc by passing and catching to your captain who is behind your goal line—introduce legal guarding. (4) 4 v 4 "Team Disc," moving as above. Introduce additional ultimate rules.
STAGE FOUR	*Objective:*	Play Ultimate using official rules.
Mastery/ Proficiency Level	*Activities:*	(1) Compose teams of 6 players and designate three playing fields. (2) Stress calling own fouls and sportsmanship. (3) Tell students the health and sports related benefits of Ultimate. (4) Organize team play. • Switch team members if necessary to balance. • Teams on ability group if necessary. (5) Evaluate student learning by skill and strategy application and written test.

Unit plan prepared by Marie Sterne of Fairfax County, Virginia, Public Schools.

recognition to teams which involved all teammates in the action.

By the end of the Ultimate unit, students will have learned, refined, and extended their individual skills and team strategies. In frisbee jargon, they will be "filling," "checking," "centering," "leading," and "clearing." You will find that you have been successful not only in raising the individual level of play, but also in increasing the numbers who are really involved in the game.

Conclusion

While Ultimate has many of the same open-skill qualities that other team sports possess, it places fewer demands on its players. By its very nature Ultimate encourages students to demonstrate versatility and creativity. All open-skills allow for such adaptability, yet the more traditional sports seem to program players at a very early age that there is a best way to perform a particular skill. There does not seem to be much allowance for behaviors to be altered in response to the ever-changing patterns of play. Nor does there seem to be much allowance for a wide range of skill-levels. In the game of Ultimate, such allowances are not only permitted but readily accepted.

References

Gold, M. (1982, June 26). The fairy tale physics of frisbee. Science '82, pp. 76-77.

International Frisbee Disc Association. (1982). Official rules of ultimate. (8th ed.) San Gabriel, CA, 1978.

Rink, J. (1985). Teaching physical education for learning. St. Louis: Mirror/Mosby College Publishing.

Tipps, C., & Roddick, D. (1979). Frisbee disc sports and games. Millbrae, CA: Celestial Arts.

Wellemeyer, M. (1984, November). The ultimate sport (ultimate frisbee). Fortune, p. 207.

Wham-O Manufacturing Company. Frisbee is a brand name and a trademark of Wham-O Manufacturing co.

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ULTIMATE FRISBEE OPINIONNAIRE

Sixth graders from Green Street School in Tupelo, Mississippi answer questions about Ultimate Frisbee:

What do you like best about playing Ultimate Frisbee?

- It's fun, exciting, challenging
- Throwing, catching, running
- Scoring, winning
- Working together
- It's like all kinds of sports
- It's more fun than football
- Everything

What don't you like about playing Ultimate Frisbee?

- Nothing
- Tiring, running back and forth
- Couldn't touch anyone, fouls
- Losing, we lost
- They didn't throw it low for me to catch

What is your favorite sport?

- Soccer
- Football
- Basketball
- Tennis
- Baseball, softball

What did you learn in Ultimate Frisbee that might help you to play your favorite sport better?

- Run fast, catch, block, and jump higher
- You have to keep away from your teammates
- How to stay in positions and make quick decisions
- Teamwork, defense, stay alert
- Controlling my throws, short passes are good, lead my passes
- Not to take steps, not to foul

Rules for Ultimate Frisbee

Ultimate frisbee is a fast-moving, competitive, noncontact sport played by two teams of seven players each, with a great deal of freedom and informality implied in the rules. Primary among these is the spirit of fair play, which enables an honor system to be an effective method of officiating.

The object of ultimate frisbee is to gain points by scoring goals. The frisbee may only be passed (no running allowed while in possession of the frisbee) forward, to the side, or backwards. A goal is scored when a player successfully passes the frisbee to a teammate in the end zone which that team is attacking. The team with the most points at the end of the game is declared the winner.

Equipment

frisbee
jerseys to distinguish teams

Playing Field

The playing field may have any surface—grass, asphalt, sand, or gym floor. The playing floor for the official ultimate frisbee game is 60 yards long and 40 yards wide. Both end zones are 40 yards wide and 30 yards deep.

If a pass is completed outside the boundary line, it is considered incomplete and the defensive team gains possession of the frisbee. Should the frisbee land outside the lateral boundary, it is returned to play at the point where the frisbee went out of bounds. The player throwing the frisbee inbounds must have one foot on the line.

Throw-off or Pull

Play begins with a throw-off. All players must be on or behind their own goal line until the frisbee is released. A player on the goal line throws the frisbee toward the other team. As soon as the frisbee is released, all players may cross the goal lines. No player on the throwing team may touch the frisbee in the air until it has been touched by a member of the receiving team.

The receiving team may catch the frisbee or allow it to fall untouched to the ground. If a member of the receiving team successfully catches the throw-off, possession begins at that point. If the receiving team touches the frisbee but fails to catch it, the throwing team gains possession of the frisbee where it is stopped. If the frisbee is allowed to fall untouched to the ground, the receiving team gains possession where it lands.

If the frisbee goes out of bounds before crossing the goal line, the receiving team makes the immediate decision of gaining possession at the point where the frisbee went out of bounds or of having the frisbee thrown off again. If the frisbee goes out of bounds after crossing the goal line, the receiving team takes possession on the goal line at the nearest corner.

Each time a goal is scored the teams switch directions of attack, and the team which scored throws off.

Play

The team in possession of the frisbee must attempt to move it into position to score a goal. The frisbee may be thrown any way a player chooses. The frisbee may never be handed from one player to another. No player may walk, run, or take steps while in possession of the frisbee. Taking momentum into consideration, should a player take steps in order to stop, play is stopped, the player returns to the point where possession was gained, and play resumes.

The player in possession may pivot on one foot as in basketball. Only one player may guard the person in possession of the frisbee. The frisbee may not be pulled or knocked out of the hands of an opposing player.

The defensive team gains possession whenever the offensive team's pass is incomplete, intercepted, knocked down, or goes out of bounds. Any player on the team gaining possession of the frisbee may throw it. Players may not catch their own throws.

End Zones

Any time a team gains possession in its own end zone (the one it is defending), the player may choose to

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resume play where the frisbee is stopped or at the goal line at a point perpendicular to where the frisbee was caught.

Fouls

A throwing foul is defined as any physical contact between offensive and defensive players sufficient to deter the flight of the frisbee as called by the player fouled. If the pass is completed, the foul is automatically declined and play proceeds.

A foul is also called when physical contact occurs as a result of the offensive and defensive players playing the man instead of the frisbee. This includes pushing, grabbing, or holding in order to prevent an opponent from catching the frisbee. The player who is fouled calls "foul," play stops, and the player fouled gains possession at the point of the infraction.

A stalling violation occurs when the player guarding the thrower calls out "stalling" and counts 15 seconds aloud. If the frisbee is not released by the end of the count, it is turned over to the defense at the point.

Scoring

A goal is scored when an offensive player has both feet in the end zone after receiving a pass from a teammate. A player in possession may not score by running into the end zone. Each goal scores one point.

Variations

The number of players, size of the playing area, type of object thrown (a nerf ball or football can be substituted for a frisbee), and length of the game (an official game consists of two 24-minute halves) can be adapted to the needs of your students.

The Shy Child in Physical Education

Deidre Connelly

The shy child, whether shy in all situations or simply in physical education and sport settings, experiences a constant state of self-preoccupation. The shy child thinks that everyone is watching as he or she attempts to perform, that everyone else can perform the skills, that performance must be perfect, and that he or she is alone in these negative thoughts and feelings.

Physical education settings can become a "safe haven" for the shy child. A supportive, encouraging physical education environment may provide the perfect setting in which to take physical and social risks such as trying new activities and being assertive with peers. Shy behavior is not "unchangeable," and the understanding teacher can be instrumental in drawing the shy child out of self-preoccupation and fear and into the freedom and joy of activity.

Children who are high in shyness are often low in self-esteem (Zimbardo, 1981). Some tend to perceive their physical competency as low and do not seem to realize that being good at an activity is often just a function of practice. Some shy students feign indifference to cover any show of real emotion. They want the attention of the teacher and peers but are afraid of that attention. Students who do enter into activities are sometimes so self-conscious and preoccupied that they are virtually ineffective at the assigned task.

For many children and adults shyness is learned behavior. It has been learned through reinforcement while at the same time there has been a lack of learning of necessary and appropriate social skills. Shy behavior is reinforced by doing things for the shy person (versus teaching self-reliant behaviors), giving attention to shy behaviors, and labeling the child as shy. The consequences of shy behavior are: falling behind peers in both physical and social skills, difficulty in meeting others, problems with making friends, feelings of loneliness and isolation, and unhappiness with self. Shy children may be viewed as "stuck-up" or unfriendly by their peers or as untalented in skills situations. These children do not get frequent positive reinforcement because they do not display their talents or abilities. A cycle is initiated in which the child does not interact and is self-preoccupied and is therefore bypassed by others, which further reinforces and maintains this pattern.

The Teacher's Influence

The teacher may induce or reduce a child's shyness. Behavior occurs in context; therefore, an appropriately structured environment and supportive, encouraging supervision may be the keys to a shy child's successful interaction and participation with peers.

The teacher must often persuade the shy child to take risks. Zimbardo (1981) pointed out that there is a fine line between encouragement and pressure. Forcing a child to compete can have a lasting negative effect; self-confidence may be diminished rather than enhanced. Combs (1976) suggested that only those who feel they have a chance of winning willingly choose to compete. The rest ignore or avoid competition.

The shy child must first learn how to perform the required skills and develop confidence in that performance. Students must understand that before they experience success in a skill or activity, failure is likely. Removing fear of mistakes or failure will enhance the student's willingness to try. The student's fears should not be minimized; rather, efforts should focus on the acceptability of mistakes made in attempts to master skills. Zimbardo's (1981) work contains this reminder: "Even if you fail at something you are attempting to do, it is not failure — genuine failure comes from being afraid to try."

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When working with children who seem afraid to try new activities:

- Assess whether the child has the necessary skills for the activity. Does the child perceive that he or she has these skills?
- Assess what the child perceives to be the hidden costs of participation. If the child knows the skills, why might he or she not want to do this activity? If the child possesses the skills and seems to want to participate despite hanging back, the teacher can help by taking tensions about playing out of the situation while relating the fun of participating as well as the anticipated benefits.
- Allow for mistakes and permit the child sufficient time to become more self-reliant. Shy children fear taking any action because of their anxiety about failing or doing it wrong.
- Teach students to take calculated risks and handle failure. A simple strategy is to teach students to ask themselves, "What is the worst thing that could happen if I tried this, played this game, told that teammate not to take the ball from me?" The feared consequence should be looked at in terms of how bad it would be. For example, "I may look silly for a few minutes while I try to get the hang of it" or "Mary may say she wants the ball for herself." The child should be taught to then ask just how bad that consequence is, with the teacher emphasizing a balanced, relaxed perspective. For example, "It won't hurt me, others are just learning, too" or "I'll feel better if I at least try to do this." The message to get across in this process is that while the attempts to reach a goal or deal with others may fail, the individual is never a failure. In addition, small daily failures are not the end of the world!

Safety in activities must be considered in the case of students who are willing to participate yet are so preoccupied with their self-consciousness that they fail to listen to instructions. In their haste to perform and "get it over with," they often hurry into a task without comprehending the step-by-step instructions. They may act impulsively, with a sense of urgency to their performance. Often when the instructor tries to slow the student down and correct the actions, the student may become upset or even belligerent. This may call for an alternative method of handling both discipline of the child's inappropriate behavior and further instruction, because public reprimand or correction may not be effective.

The situation may be resolved effectively by dealing with the student in a one-to-one setting during or immediately following the class period. The first step would be to note the inappropriate response to instruction without dwelling on the issue. Following that, it is helpful to inject some words of encouragement or a compliment about some aspect of performance. Having established that some behavior was inappropriate while encouraging positive self-feelings, instructions for the specific skill or general guidelines about slowing down and listening behaviors may be given.

Working with Shy Students

- Shy children like structure and fear the unknown. Be sure the students know what is expected of them in both the overall setting and then specifically in each activity.
- Shy children fear evaluation and looking foolish. Activities should be nonthreatening (although not necessarily noncompetitive) with reasonable expectation for success. Sometimes group efforts which make it easy to join in provide a means to participate while sharing responsibilities, credit, and failure. Caution: group selection should be carefully managed so that the withdrawn child is not made to feel more isolated or unwanted.
- Keep communicating even when the child does not offer a lot of response. Shy children need time to get to know you and their peers. Devise some small game or group activity which involves two or three children, avoiding "spotlight" situations which involve introductions or group speaking at first.
- Always reward attempts at being more assertive or self-reliant. Do not wait for success; rather, reward efforts along the way to encourage the desired behaviors.
- Avoid calling attention to shy behaviors or openly labeling a child as shy. These actions reinforce and maintain the shy patterns of behavior.
- Don't dismiss the shy child's fears as trivial. Do not tell the child there is nothing to worry about if the child is indeed worried. The child's perception of the situation as threatening makes it real to him or her. Rather, focus on changing the perception of the situation to one of a supportive situation in which attempts are looked on favorably and mistakes are part of the learning process.
- Establish an atmosphere of nonjudgmental evaluation both from the teacher and other students. All students will benefit from feeling free to experiment, ask questions, and make mistakes. Studies show that strongly supporting environments, that is, those in which adults are encouraging but do not force children to do things against their will, help children overcome shy tendencies while the children are still young (Kagan, cited in Kelly, 1987).

- Teach tension relaxation skills, which help all children deal with anxieties and foster self-control.
- Teach the use of positive self-talk (including self-encouragement and positive expectations about performance) and rational thinking (for example, use of the worst case scenario dialogue outlined earlier).
- When possible, give children decision-making opportunities and choices. Encourage independent thinking and self-responsibility. Having children keep records of progress or skill accomplishment or giving duties such as distributing and collecting equipment will help children develop responsible behavior both on their own and with others.
- Encourage helping behaviors. Have one half of the class work on a skill or drill while the other half works on a different activity. Provide time for each half to "teach" the other group that skill in one-on-one or small group situations.
- Be patient. Shyness may be learned and reinforced over a long period of time and hence may require a great deal of time, patience, and creative thought by the teacher attempting to assist the child in overcoming these tendencies.

The sensitive and understanding teacher can have a significant influence on a shy child. By providing opportunities to learn skills and develop confidence, and by offering encouragement, the physical education teacher provides the perfect environment in which a child can overcome the negative cycle of shyness.

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References

Combs, A. (1976). The myth of competition. In A. Yiannakis, T. McIntyre, M. Melnick, & D. Hart (Eds.), *Sport sociology: Contemporary themes* (pp. 81-84). Dubuque, IA: Kendall/Hunt.

Kelly, T. (1987, August 23). In family trees, shyness can be pruned. *Chicago Tribune.*

Zimbardo, P.G. (1981). *The shy child.* New York: McGraw-Hill.

Remedial Motor Education:
Some Practical Suggestions

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The term "clumsy" or "physically awkward" is often applied to children who have difficulty learning motor skills and to those who display inefficient motor behavior in normal everyday movement activities. Although motor development is a continuous and orderly process with individual variation in the rate of development, clumsy children tend to lag behind their peers in learning motor skills. This developmental lag is frequently observable in the qualitative aspects of fundamental skills acquisition before quantifiable measures underscore these differences. These children "look different" from their peers when performing the same skill. Unless the qualitative differences are overcome they will also display delayed and/or inferior performance on various standardized sensorimotor, perceptual-motor, and motor proficiency tests.

In addition to immature and substandard motor performance, clumsy children are often differentiated from normal children by other characteristics such as those identified by Haubenstricker and Seefeldt (1974) and Haubenstricker (1982). Some of these characteristics may be developmental in nature; that is they are exhibited by children of younger age levels and continue to persist in the motor patterns of older children in whom the characteristic has not been extinguished or suppressed. Others may be caused by neurological disorders and/or environmental influences. These characteristics are not necessarily mutually exclusive and a child may exhibit one or more of them, but rarely all of them. The characteristics to be considered are: inconsistency of performance; perseveration; mirroring; asymmetry; loss of dynamic balance; extraneous movements; inability to maintain rhythmical pattern; inability to control force; inappropriate motor planning; and falling after performance.

Physically awkward children are often excluded from playground activities and are ridiculed by their peers because of their physical inabilities. Consequently, they not only have negative feelings about themselves in situations that involve activity and begin to withdraw from such social settings, but they become disinterested in any physical activity, with a resultant decrease in their level of physical fitness.

General Guidelines

The following guidelines for remediation of motor skills apply to all children with gross motor deficits. These guidelines provide the framework within which the remedial process should take place.

1. The level of skill development and the specific movement characteristics that hinder skill acquisition should be determined before attempts at remediation begin.
2. Remedial efforts should be based on thorough evaluation of the child's medical and behavioral history, conducted by qualified personnel.
3. Remediation is best accomplished during early childhood when motor patterns are most readily modified. Attempts at remediation are most effective when immature or inappropriate behaviors have not been ingrained in the nervous system.
4. Remedial efforts should be planned on a long-term basis, particularly when the deficit has existed over a period of years.
5. Parental involvement is important. Parents who are able to provide psychological support and the opportunity for extended practice are important con-

Teaching Tips

Because awkward children typically interpret their performance as being inadequate or unfavorable, teachers must be sensitive to the nature and the structure of the learning environment. The following tips are provided to assist teachers and parents in this endeavor.

- *Demonstrate exactly what is to be accomplished.* Remediation often requires achieving a series of obtainable sub-objectives in order to reach the long range objective. The sub-objectives must also be demonstrated.
- *Modify task demands so that success is assured.* Skill building is a gradual process. The demands of the task must be within the capacity of the child.
- *Provide ample practice time to develop skill mastery.* Changing established motor patterns and/or learning new ones can take time for children with movement disabilities.
- *Be patient with the progress and sensitive to the needs of children who are motorically awkward.* Small gains should be reinforced positively, but honestly, because physically awkward children are keenly aware of their shortcomings.
- *Generate feelings of enjoyment and self-worth through successful attainment of objectives.* This can be accomplished by reinforcing success with positive feedback. Rewards of free choice activities can be used to celebrate accomplishments.

CHARACTERISTIC	DESCRIPTION
Inconsistency of Performance	Trial to trial variation in motor performance greater than expected
Perseveration	Continuance of behavior when circumstances no longer require it
Mirroring	Inability to separate personal directional movements from those of the teacher
Asymmetry	Inability to coordinate movements requiring bilateral use of limbs
Loss of Dynamic Balance	Inability to maintain balance while moving
Extraneous Movements	Inclusion of unnecessary or extraneous movements
Inability to Maintain Rhythm or Pattern	Timing of rhythmic movement disrupted after several movements
Inability to Control Force	Production of too much or too little force
Inappropriate Motor Planning	Inability to integrate sensory input with past experiences to carry out a task
Falling After Performance	Falling upon completion of a motor task without any apparent reason

ASSESSMENT	**TEACHING-LEARNING STRATEGIES**
Have child perform one fundamental motor skill three to five times	Always show mature form when demonstrating • divide skills into component parts • encourage mastery of prerequisite skills • assure initial success • provide frequent, short practice periods.
Have child perform repetitive motor skill does movment continue after task is completed?	Demonstrate skill exactly • set space limits on performance, use simple to difficult progression • use key words in instruction, provide exact verbal feedback • play "copy cat" with child • use games with movement limitations, such as musical chairs.
Ask child to respond to verbal directions to movement does child respond to verbal or visual cues?	Have child identify body parts • practice laterality and directionality • face away from the child during demonstration • use visual and verbal cues simultaneously • use visual and verbal cues independently
Ask child to perform skill which requires asymmetrical movement	Have child swing both arms in all directions • use activities which require bilateral integration • practice symmetrical skills such as jumping jacks • force use of inactive side of body, if present.
Have child complete an obstacle course walking and then running	If lack of strength, develop strength • develop postural and static balance first, • practice on floor and then balance beam • progress from simple to more difficult dynamic balance • progress from restricted to open space • combine dynamic and static tasks
Observe child performing skills and watch for unnecessary movement	Show mature model of skill • provide clear and specific demonstration and description • provide verbal and visual feedback (video camera helpful).
Observe child hopping across room and watch for loss of rhythm or pace	Assess child's performance before tempo imposed, use part-whole teaching approach, gradually increase tempo of activity, provide external rhythm or music
Ask child to perform skills which require appropriate force	Progress to control body, object, and then body with object • teach concept of imparting varying force • provide experience using different forces • use shaping techniques to teach varying force.
Provide child with a serial task such as tying a shoelace or walking a maze, does child complete the task, make inappropriate responses, give up?	Start with simple serial movement patterns and increase difficulty • provide step-by-step approach • make sure child understands sequence • provide visual cues (e.g. painted footprints) to follow
Watch child complete a variety of skills (throwing, hopping, jumping, kicking), determine if fall is caused by loss of balance or other factors	Be sure child understands that falling is not part of the skill • control amount of force (e.g., throw softly) • review balance work • have child practice skill holding onto a partner or chair • provide movement boundaries such as a mat to land on or footsteps to follow • avoid reinforcement of falling by smiling or laughing

tributors to the remedial process. The attempts by parents to assist in remedial movement education must be screened to ensure that they are aiding the process.

6. Instruction should begin on a one-to-one basis so that objectives can be personalized and the probability of successful remediation is increased.
7. Effective remedial instruction depends on a knowledge of the developmental level of the child, the nature of the task demands, the learning environment, the cultural context, the interests of the child, and an awareness of how these variables interact in the learning process.
8. The social context of the child should be analyzed so that appropriate skills can be chosen.
9. The child must be actively involved if changes in behavior and attitude are to occur.
10. Instructional cues that are pertinent to the instructional objective and lots of positive feedback are essential if changes in motor behavior are to occur.

Remediation of Motor Characteristics

The remediation of motor skills in children should be specific to the skill or skills in question, However, when skill deficiency is caused by, or accompanied by, one or more of the identified characteristics, efforts at remediation must focus on the motor characteristic itself. Information on the ten characteristics described by Haubenstricker and Seefeldt (1974) and Haubenstricker (1982) is presented in the table on pages 226-227. In the table, the characteristics commonly displayed by clumsy or awkward children are identified and defined. Next, an assessment procedure is suggested which allows the teacher to observe the child and isolate the characteristic in question. Finally, teaching-learning strategies are provided as examples of ways in which the distracting behavior may be modified or eliminated. These teaching tips are intended to help teachers and parents to provide a positive learning envimment for the remediation of motor skills in clumsy or awkward children.

References and Resources

Arnheim, D.D., & Sinclair, W.A. (1979). *The physically awkward child: A program of motor therapy* (2nd ed.). St. Louis: C.V. Mosby.

Gubbey, S.S. (1975). *The physically awkward child*. Philadelphia: Saunders.

Haubenstricker, J.L. (1982, May). Motor development in children with learning disabilities. *Journal of Physical Education, Recreation and Dance*, 53(5), 41-43.

Haubenstricker, J.L., & Seefeldt, V. (1974, March). Sequential progression in fundamental motor skills of children with learning disabilities. Paper presented at the annual conference of the Association for Children with Learning Disabilities, Houston, Texas.

Wall, A.E. (1982). Physically awkward chldren:A developmental perspective. In J.P. Das, R.F., Mulcahy, & A.E. Wall (Eds.), *Theory and research in learning disabilities* (pp. 253-268). New York: Plenum Press.

Establishing Structure in the Elementary School

B. Ann Boyce and Pam Walker

Editor's Note: *Strategies* places a high degree of importance on the need for college-based educators to collaborate with professionals in the field to achieve the most effective advances in physical and sport education. The following article represents just such a collaboration between B. Ann Boyce of the University of Virginia and Pam Walker of Red Hill Elementary School in North Garden, Virginia. Together they identify the need for established structure in the gymnasium and offer specific exercises to achieve it.

"What do I do on the first day of class?" This is one of the most important questions preservice physical education teachers ask. And the answer is equally important — establish structure.

Teachers manage behavior in one of two ways, with established structure or with current interaction. They represent two ends of a continuum.

Structure is established by setting class rules and procedures and establishing general expectations of appropriate student behavior. Where structure has been established there is "internalization by pupils of limits to behavior, patterns of behavior that are carried out, and sequences of activities that have been established in the past" (Soar & Soar, 1979). It does *not* address student behavior that "comes out of nowhere," but rather behavior that has a history or pattern. An example of established structure is a group of students who quicky get into their squads as the instructor enters the gym without being told to do so.

In contrast, "current interaction, verbal and nonverbal, is a here-and-now attempt by the teacher to support or modify pupil behavior" (Soar & Soar, 1979). An example of a current interaction is an instructor who continually reminds students that they should get into their squads prior to roll call.

These two behavior management techniques will be tested by students — students will speak out of turn or rush into a teacher's office without knocking, they will leave the gym without permission — anything to see whether a teacher will react. Most veteran teachers intuitively understand that to control these behaviors, established structure will be more successful. It will be particularly necessary around holiday and vacation time when student testing behaviors will be increased or renewed.

So how do you do it? With 40 plus students and one activity area, how does a teacher simplify student management without sacrificing student learning? Although most veteran teachers utilize rules and procedures as an integral part of their classroom management style, timing practice, and reinforcement (feedback) play key roles in establishing structure.

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Timing. Knowing when to teach rules and how to monitor students is a necessary part of established structure. To be effective, a teacher must recognize when a student is testing the rules and quickly stop it before it spreads throughout the classroom (ripple effect). Many teachers start imparting rules and procedures the first day of class and then practice and reinforce them on following days or weeks. This is not to say a teacher cannot cover instructional materials on the first day of school; however, teachers usually use a whole-class structure and the work is familiar or review (Evertson & Emmer, 1982).

Practice and reinforcement. Even though teachers initiate instruction early in the school year, they still allow time for practice and reinforcement of rules and procedures as a regular part of class. Elementary teachers create instructional games that allow students to practice and receive feedback on a particular rule or behavior. For example, one of the hardest lessons to teach young children is to stop and listen (Graham, Holt/Hale, & Parker, 1987). Toward this end, games in stopping and freezing on signal are often incorporated into the instruction. Some of these games have students stop and freeze in the shape of a letter, animal, or symbol — thereby combining both instructional and behavior management tasks into a single activity.

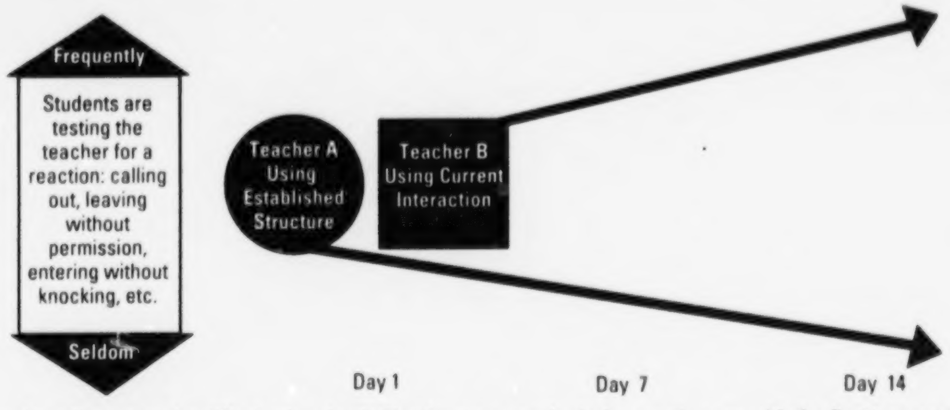
Whether students are allowed to practice rules, behaviors, or procedures via games or simply by exhibiting behaviors that are then subject to teacher monitoring and feedback, teachers must anticipate and plan for this type of managerial activity as a regular part of the class period.

A Teacher's Philosophy for Establishing Class Structure

Pam Walker is a veteran elementary physical education teacher who has established structure in her classes. Her elementary school is located in a rural setting with most of the students coming from a low SES background. In addition, this school has a large migrant population as well as mainstreamed LD, TMR, and EMR students. For seven out of eight years that Pam has taught at this school, the average class size has been 42 with a range of 36 to 54 students per 30-minute (back-to-back) period.

Pam's method is not the only way to establish class structure but it has been successful; it is hoped that the reader will gain some helpful ideas.

Pam has set up her classes on the premise that each student is responsible for his or her own behavior. She has explained the rules and procedures to all students as well as her expectations for class behavior. She has also explained the consequences for certain behaviors and given her students the freedom to choose the behavior that has the most desirable consequence. To help students take responsibility for their actions, Pam has posted rules in the gymnasium. Having outlined the


Frequently
Students are testing the teacher for a reaction: calling out, leaving without permission, entering without knocking, etc.
Seldom
Teacher A Using Established Structure
Teacher B Using Current Interaction
Day 1
Day 7
Day 14

This chart illustrates the differing levels of effectiveness, particularly over time — with the first two weeks of school being most important — of current intervention and established structure. It predicts that if, during the first two weeks of school, teachers fail to establish structure, then the number of occasions when students test the limits will increase until the teacher loses control of the class. Although establishing structure will not completely eliminate this problem, it should greatly decrease it.

This model was derived in part from the work of Doyle (1979) and Soar & Soar (1979).

Establishing Structure with Students at Different Grade Levels

Since a student's age affects how a teacher would establish class structure, separate guidelines for students of differing ages are recommended.

Kindergarten

Day One:

1. Orientation to the gym—Who is the teacher? What is the gym? (A place to have fun);
2. Start teaching rules—how to enter class; not to talk when the teacher is talking; how to freeze when a signal is given;
3. Teach—personal and general space; play space bubble game with freezing using basic locomotor movements;
4. End with review of rules and how to leave class.

Day Two:

1. Review the day-one rules;
2. Teach warm-up exercises;
3. Review personal and general space and freezing;
4. Play game called "I See"—movements patterned after designated animals; purpose of game is to teach listening skills.

Days Three through Ten:

1. Review of rules;
2. Basic movement patterns with emphasis on listening skills and following rules.

Grades 1 and 2

Day One:

1. Teach and/or review all rules posted in the gym;
2. Teach the Chicken Dance (focus on warm-up and movement exercise and review concepts of levels, directions and following directions);
3. Play game using the above concepts.

Days Two through Five:

1. Continue to monitor and reinforce rules when necessary.
2. Continue to play a variety of games that reinforce personal and general space, freezing, and listening skills; Review a few games used in kindergarten as well as use more complex games for grades 1 and 2:
   a. Shipwreck (teaches listening, following directions, remember certain movement patterns, locomotor skills, teamwork)
   b. Traffic Cop (teaches freezing to a signal, locomotor movement)

Days Six through Ten:

1. Teach regular class content with an emphasis on listening and following directions; continue to monitor and correct inappropriate behavior

Grades 3 through 5

Day One:

1. Teach and/or review all rules posted in the gym.
2. Reinforce rules through repetition and listening games.

Days Two through Ten:

1. Teach regular class content while continuing to monitor and correct inappropriate behavior

Note. If a child is new to the school a buddy is assigned for the fist few days to help the child learn the rules.

Physical Education Class Rules

- Walk, do not run, into the gym.
- Sit on the center line when you come into the gym
- Wear tennis shoes or shoes with rubber bottoms
- Wear shorts or pants
- Sit quietly when directions are given
- Freeze and listen when you hear two claps and see the teacher's hand up
- No gum or candy
- No fighting or arguing
- Go to the bathroom before coming to class

P.U. Points
1 P.U. Point = talking, running, gum, candy, shoes, not listening
2 P.U. Points = not playing
3 P.U. Points = fighting or arguing

rules and her expectations for the class, she accepts nothing less.

Pam reinforces the rules and class routines with repetition and game playing, and she uses a three-level monitoring system when a student's behavior is inappropriate. Her three-level monitoring system begins with a glare that says "stop that," progresses to a verbal warning and a reminder of expectations and consequences, and culminates with time-out during which the student is expected to think about the inapprorpriate behavior. The student decides when he or she is ready to return to the activity, but not before talking with Pam who poses the questions, What are you doing? What is the rule? and What should you be doing? This system takes care of almost all of the student initiated testing behaviors.

In summary, the key to establishing structure in the gymnasium is the deliberate planning and practicing of rules, behaviors, and procedures with active monitoring and early teacher intervention. However, this is not to say that if a teacher establishes structure all behavior problems will disappear. But this strategy should greatly reduce the amount and frequency of student testing behaviors.

To many novice teachers, it may seem easier "to let things slide," at least initially; however, teachers should consider the long-range effects of such actions. The consequences of ignoring early student testing behavior and failing to establish structure are decreased instructional time and ultimately the sacrifice of student learning.

References

Doyle, W. (1979). Making managerial decisions in classrooms. In L. Duke (Ed.), *Classroom management* (78th yearbook of the National Society for the Study of Education, Part 2). Chicago: University of Chicago Press.

Evertson, C.M., & Emmer, E.T. (1982). Effective management at the beginning of the year in junior high classes. *Journal of Educational Psychology*, 74(4), 485-498.

Graham, G., Holt/Hale, S.A., & Parker, M. (1987). *Children moving: A teacher's guide to developing a successful physical education program* (2nd ed.). Mountain View, CA: Mayfield.

Kounin, J.S. (1970). *Discipline and group management in classrooms*. New York: Holt, Rinehart & Winston.

Soar, R.S., & Soar, R.M. (1979). Emotional climate and management. In P.L. Peterson & H.J. Walbert (Eds.), *Research on teaching: Concepts, findings & implications*. Berkeley, CA: McCutchan.

Resolving Conflict in the Gymnasium

Robert N. Horrocks

Physical education provides opportunities to encourage interpersonal communication and understanding among children. These opportunities, however, are occasionally manifested in the form of minor conflict situations. At times the children in my 5th and 6th grade classes will approach me protesting that another student has offended them by hitting them with a ball, or has verbally insulted them. Such protests appear more in some groups than in others and are evidence of the varying levels of social and emotional development of children.

I have observed the students' differences of opinion occur more often during small group instruction when the instructor's attention is diverted from the total group of children. This situation provides a dilemma for the instructor who, while involved in instruction with another group of students, has not observed the origin of the conflict. At this point the two students approach (or are summoned to) the instructor, often with their personal eye witnesses ready to support their story, and demand justice. To avoid being put in the position of judge and jury, and to encourage interpersonal communication, I have adopted the following policy:

The two students are first reminded that arguments often have their basis in "misunderstandings" or in "mistakes." They are then told to remain on a specially designated bench, referred to as the "talking bench," until they have agreed upon the origin of their argument and both parties have apologized.

The motivation for completion of this process rests with the children's desire to resume their activity in the classroom. I have found that there is a direct correlation between the speed with which students settle disputes and interest in the classroom activity. It is important that teachers be sensitive to the differences between students' apologies that are based on an understanding of the causes of the conflict and those that are based entirely upon the students' desires to resume activity. The latter often result in a reoccurrence of personal conflict in future activities. To eliminate this, the two students must report to me before they resume activity. At that time I ask a series of questions which reveal the students' sincerity in their efforts to resolve their dilemma. The questions include:

"Did you, John and Bill, determine how the argument started?"

"How *did* the argument start?"

"Was the argument caused by a misunderstanding?"

"Was the argument caused by a misjudgment or a mistake that one or both of you made?"

"John, did you apologize to Bill?"

"Bill, do you accept John's apology?"

"Bill, did you apologize to John?"

"John, do you accept Bill's apology?"

"Do you, John and Bill, feel that the argument is finished?"

If specific questions are responded to negatively, or in such a manner that the teacher feels the students have not totally resolved the situation, they are asked to return to the "talking bench" and resume discussing their differences of opinion. Agreement must be reached by both parties for the conflict to be considered terminated. It is imperative that teachers know their students and are capable of assessing their students' sincerity.

Most conflicts in the physical education program result from incidental accidents in which the intention of actions is not considered. This is predictable, as Piaget[1] and Kohlberg and Gilligan[2] speak of intention-

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ality of behavior as a developmental concept which begins to be understood between the ages of 10 and 12. Prior to this understanding, children feel that blame for an accident is measured by the severity of the accident and not by the intentions of the person committing the act. It is not unusual for students to feel that they have been offended as a result of their being victims of an accident; a 5th or 6th grade child who has been incidentally tripped in a basketball game will sometimes accuse his opponent of tripping him on purpose.

Our approach to dealing with minor conflict situations has proven to be very successful. I have observed that students who were involved in arguments and were provided an opportunity to discuss their differences, later select each other as activity partners.

The strategy described here is successful because students are motivated to resolve conflicts in order to resume their activity, resolution of conflicts is more readily accepted when arrived at by students rather than by teachers, and the process of determining intentionality of actions is encouraged through dialogue.

Endnotes

1. Piaget, J., *The Moral Judgment of the Child*, Routledge and Kegan, Paul, New York, Free Press, 1932.
2. Kohlberg, L., & Carol Gilligan, "The Adolescent as a Philosopher: The Discovery of the Self in a Postconventional World," in J. Kagan & R. Coles (Eds.), *Twelve to Sixteen: Early Adolescence*, New York, Norton, 1972, pp. 144-179.

Discovering the origin of their argument on the "talking bench" is a step toward reconciliation.

Shoestrings and Shoeboxes

Diane M. Lewandowski

What do you have? ***Problems.***
What do you lack? ***Cash.***
What can you do? ***Create, create!***
Use ***ingenuity*** plus ***time*** to transform drab left-overs into ***delights!***

"Hello, is this my supervisor? It is—good! Would you please come to my school to give me some help? What's my problem? Plenty! I'm expected to teach physical education with no equipment or supplies to overcrowded classes of students in a gym that is also used as a lunchroom and an auditorium. Please come soon. This is a problem."

This cry for help is common to many physical education teachers. Too often, because physical education is viewed as play, space and equipment to support student learning is not available. Indeed, we are asked to provide physical education in a "shoebox" and on a "shoestring."

Solutions for Insufficient Space

Large gym. One solution is for teachers to team teach identical grade level classes. Task learning centers or stations will facilitate maximum use of the space. Charts, pictures, and check sheets monitored by leaders or captains, and other visuals will enhance learning. Develop a leaders' class if possible for upper grade students who can assist teaching.

Small gym. If a gym is not large enough for double classes, rotate the gym with a classroom. One of the physical education teachers travels to the classroom where desks are moved. When weather permits, physical education classes should be held outdoors instead of the classroom. Large areas in the school basement can be transformed into a cheerful and workable multipurpose room. Although sometimes the gym also serves as the lunchroom, which negates its use during lunch, schools with bag lunch programs sometimes can be convinced to have students eat lunch in classrooms.

If the gymnasium is also the auditorium, school assemblies can play havoc with physical education program continuity. Suggest to the principal that assembly programs be scheduled when weather permits outdoor physical education activities.

Class size. Often the class is too large for effective learning and meaningful activity. The best solution, of course, is to reduce the class size and employ another instructor on a full or part-time basis. If space is a problem, some of the previous solutions may be applicable. Another solution is to reduce the time for each class. Although this solution is not desirable, it does allow each student's time to be spent more productively.

Solutions for Insufficient Equipment

Funds. The common cry of many physical education teachers is lack of equipment and supplies. Every effort must be made to secure sufficient funds either from the school budget or from other sources such as PTA, booster clubs, canteens, and so forth. Many parent and/or business groups which support good physical education programs often look for fund-raising projects for the school. An excellent physical education program is good public relations and can encourage financial support from the community.

Jog-a-thons, dance-a-thons, and other physical activities can serve as excellent fund raisers. Faculty-student games and physical education demonstrations are also good revenue sources for physical education equipment.

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Low or No Cost Equipment. "Junk in the Gym" items have increased in popularity for the past several years. They usually are available at no cost or at minimum cost to the school. Discarded household items can be cut, adapted, painted, or added to with little time or money to provide equipment. How such equipment is made and can be used is presented in Figure 1.

Class size, space, and equipment and supplies are the shoestrings and shoeboxes of the physical education program. Children can fit into "shoeboxes" for physical education, and—using "shoestrings" for equipment—schools can offer desirable programs. "Hello, is this my supervisor? It is—good! Come over and see how we have filled our shoebox on a shoestring."

Figure 1. Homemade Equipment

Equipment	*Construction*	*Activities*
Frisbee	Cut circular pieces of foam rubber. Contact a mattress company or a furniture house for purchase of end pieces. Foam rubber cushions and pillows are available in most drapery sections of department stores. Each pillow can be cut to provide two frisbees.	Throwing, catching, and games; teach trajectory concepts.
Discs	Cut cardboard into large circles about 12" in diameter. Paint and shellac each piece.	Balancing, throwing color recognition, spinning, rolling.
Markers or bases	Cut pieces of carpeting into strips or squares. Spray the ends with an adhesive substance.	Stepping stones, bases, balancing, stations.
Bowling pins	Fill quart size plastic bottles with sand or stones or decorate tennis ball cans.	Bowling, rolling activities, targets.
Scoops	Cut out a portion of a half-gallon size plastic bottle with a handle to form a scoop.	Catching.
Paddles	Bend a wire hanger into the shape of a paddle. Cover it with nylon panty hose. Straighten the handle, wrap the hose around it, secure it with masking tape.	Striking activities.
Balls	Crumble newspaper and wrap with masking tape.	Throwing, striking, rolling.
Scooters	Purchase or request end pieces of wood doors from a lumber yard. Purchase plastic wheels from a hardware store and attach. Cut a hole in the scooter center for stacking purposes.	Scooting, leg and arm exercises.
Jump ropes	Request plastic tubing from hospitals; cut and knot ends.	Rope jumping.
Weights and stations	Collect tires and paint.	Wrestling, pulling, races, relays, crawling.
Wands	Purchase plastic golf club sleeves from a sporting goods store	Exercise, striking, rolling.
Rhythmic equipment	Large cans with edges, round rod sticks, bamboo poles for beating and coffee cans filled with stones or nuts and bolts.	Dances, creative activities.
Targets	Plastic milk cases or large cardboard boxes. Cut out geometric shapes in two sides, a face of a clown with an open mouth and 2 large holes for eyes, and/or other figures.	Bean bag toss.
Shapes	Cut string or yarn about 2 or 3 feet in length.	Perceptual motor activities.
Grids	Purchase oilcloth and design a grid which can be used for games.	Word and math movement games, hopscotch, and roly poly.
Storage	Plastic milk cases	Store records and/or books.
Stilts	Clean and decorate large cans. Punch a hole at either side of the top of the can. Lace plastic rope about 48 in. through the holes; tie the ends together.	Balancing activities.

Eliminating Sex Role Stereotyping in Elementary Physical Education

Allan A. Rupnow

Efforts to minimize and eventually eliminate inappropriate learning environments for both boys and girls are desperately needed. It is both amazing and disappointing in these times, when equality in learning opportunities is expected, to visit an elementary school and observe obvious sex role stereotyping. Unfortunately, it is all too common a sight in some elementary school physical education programs to view situations such as boys lines and girls lines, boys teams against girls teams during game/sport units, boys involved in one activity, girls involved in a different activity at the same time, competition occurring even though the activity overwhelmingly favors one sex and allows the skilled to dominate, and environments that focus purely on the subject matter with concern for individuals appearing to be merely secondary.

Promoting equal opportunity requires serious pre-impact (pre-class) thought. Most teachers realize that textbooks listing characteristics of children in the intermediate grades note that sex antagonism is a way of life for many youngsters—a normal stage that females and males go through. I believe, however, that in our society boys and girls knowingly and unknowingly have been socialized into believing that antagonistic behavior is not only normal behavior but also a positive response to societal expectations.

Understanding the potential of boys and girls to achieve high skill level and concomitant high-level cooperative behavior, the specialist must constantly evaluate what behaviors are occurring, how they occurred, and why they occurred in class. Therefore, the need to pre-plan, pre-design, and pre-think the outcome of activities and lessons in relation to the equality issue is an important daily regimen of the teacher.

Ideas to Help Eliminate Sex Role Stereotyping

This philosophy was presented in New Orleans at the 1979 AAHPERD national convention, by Eve Wiseman and Chappelle Arnette, from Western Washington College, as a result of Project Active. Movement education and movement training, sharing activities, and boys and girls working together were fostered, with the live demonstrations making the spectators aware of the potential of appropriate environments in developing healthy positive relationships for boys and girls. The following nine general ideas are offered for the elementary school specialist as an aid to help eliminate sex role stereotyping and to promote environments of sharing and caring about each other.

1. **Individualize**—allow some class time for working alone; place an emphasis on helping students learn that each person is considered important and highly valued, and that everyone else cares about that person.

2. **Opposite Sex Partner Activities**—copy your partner routine, make up a game together, do a routine together, make decisions together in problem solving activities; most important, work with that partner in a common bond toward a goal.

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3. Equipment Variation—varying the type of equipment and arranging the environment in a neutral way so it does not favor or is not arranged for a boy or girl is possible. See Peter H. Werner's text, *A Movement Approach to Games for Children* (Mosby), for expanding general ideas with specifics.

4. Sharing Something—opportunities for the children to share something they have done or can do with someone else, a partner or a small group; this tends to promote self-worth and self-esteem as well as cooperation.

5. Equal Reinforcement—verbally and with bulletin boards, charts, or whatever motivational materials are used, make sure both sexes are receiving adequate and equal feedback.

6. Team Games—discover new and varied ways to assemble children into small and large group situations. Eliminate boys and girls lines, lining up, and numbering off, girls teams, boys teams, and if possible eliminate the large group activity especially in a sports setting (Werner's book has numerous specific ideas).

7. Same Expectations—structurally and anatomically neither sex has the advantage; differences in performance have been socially imposed. Therefore, the instructor's attitude must be one of expecting excellent performance from each sex and promoting the learning environment so this goal can be achieved.

8. Focus on Learning—helping each child achieve, create, and be involved will promote learning and motor development and help eliminate emphasis on those who can learn so easily and quickly.

9. Teaching Method—boys and girls need direction, and using an indirect method of teaching will more often than not allow for child decision making and situations that the teacher might make use of to accomplish the objective of creating a more humanistic environment.

Many teachers have already instituted a strong and worthy program in meeting the objective of equality for girls and boys. The ideas presented here may provide the encouragement needed to motivate others to improve their environments for young learners.

Evaluating the Child: Issues for Dance Educators

Susan Warshaw Stinson

While progress is still slow, dance continues to gain greater legitimacy among public school educators, with more states establishing certification of dance teachers and passing mandates for dance in the schools. Coupled with this greater acceptance, however, is a demand that dance meet the standards of other academic disciplines, including accepted evaluation procedures—defining levels of competency children are expected to achieve by different ages, with appropriate techniques to measure and record these.

The issue of evaluation has been a problem among dancers and dance educators for some time. One reason is that there is a concern over the uniqueness of each individual, and this does not seem to fit the standardized grading categories of public schools. Also, dance education tends to be process rather than product oriented, and process is not always readily observable. The affective area is significant in the dance experience, and development in this area is often difficult to measure. However, the knowledge and skills involved in dance are just as definable as those required to master a foreign language or write a story, and therefore, it would seem just as possible to set up standards for evaluating them. This can be done, but it does not seem to be a "simple matter."

The real reason the evaluation process has become an issue for dance is not because dance is a "special animal" among academic subjects, or because the issue is also present, or should be, among other disciplines as well. The problem then becomes how to define competency.

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Defining Compentency

In examining the development of any skill, for example, learning the multiplication tables, when does a child *know* them, how fast must he/she do the computations, and how many errors are allowed? It is obvious that there are degrees of knowing, and our definition of just what level indicates "knowing" is purely arbitrary—an operational definition. Furthermore, even after a child scores 100 on a test, forgetting can occur if the skill is not practiced.

In looking at motor skills, the same problem exists. When do we say that a baby walks . . . at the first step, or the first time across the room? Again, it is not possible to say the exact time the child "can walk" but eventually we realize that the skill has been mastered to the degree that it is practically automatic, and the child does not have to think about it anymore.

People do not forget how to walk; but is that because walking is so well mastered, or merely because it is practiced so continuously? Other motor skills, however, can be forgotten or at least can significantly deteriorate.

This, of course, is one reason that dancers—and athletes and musicians—must continue to train daily, no matter what their level of expertise. The practice is not just to keep the muscles from deteriorating, but to keep them from forgetting patterns of use, intricacies of timing, and so forth.

Furthermore, it is not enough for professional dancers to just go through the motions of pliés every day; they must be done with the same level of conscious awareness as though this were a brand new skill, reminding the body of all it knows about pliés.

Measuring Competency

All teachers are aware of the phenomenon of "test anxiety"—individuals seem to know material well but enter the test environment and suddenly become unable to function. Usually we think of athletes performing their best in competition, but anxiety can have negative effects on motor behavior as well. Many times, when children know they are being "graded" on any skill or point of understanding—in dance or anything else—their performance suffers.

Many of the problems involved in traditional evaluation procedures are not unique to dance, but are common to all types of learning. One cannot say what children know without arbitrarily defining knowing, and that is subject to error in measurement. All one can do is describe what they are doing and have done.

Evaluation Provides Feedback

The major purpose for evaluation is not to rate children against each other or an arbitrary outside standard, but to give feedback to the individuals involved, reinforcing their awareness of what they are doing and how they are doing it. This awareness is highly significant in the learning process, because so much that we "teach" children involves not putting new information or skills into them, but simply helping them become aware of what they know and what they can do.

Even when children learn by imitating outside sources, they are generally not aware of how successful they have been, or what they have done at all. This awareness is crucial not only in helping a child develop skills, but in transforming movement into dance. Dance does not exist without the quality that comes from sensing one's self in motion and stillness. Teachers can help children develop awareness by adding their senses to the child's, observing their performance, and giving them feedback. Evaluation thus becomes an essential part of the learning process and the artistic process.

If children are to receive this kind of feedback in dance, teachers must be skillful at observing and analyzing motion, in both its physical and artistic terms, and also have a vocabulary for communicating this to children. It is not enough to say "That's a good leap"; the teacher must be able to describe to the child just what he/she is doing.

The teacher must not just say "That was an interesting study," but say what made it interesting — dynamic changes, use of levels, or whatever. The study of Labanotation and Effort/Shape, as well as the principles of aesthetic form, seem essential in training teachers to operate in this way.

In addition to its value in shaping the child's learning and artistic development, this kind of feedback has other advantages. It tells a child that the teacher is truly looking at him/her, and thus enhances self-esteem. It frequently is much more successful than praise, which can make a child feel anxious about whether or not he/she receives it.

A teacher who is skilled in movement observation can use it to describe a child's development over time, allowing information regarding progress to be given at the end of a term. It is also a most useful tool in guiding the teacher toward planning future classes, as it indicates which elements of movement may need to be brought back into the children's awareness.

The children and their performance thus serve as a guide for curriculum, again based on what they are doing and not doing. Reinforcing children's awareness in this way guides them toward becoming perceptive and articulate evaluators of their own work and that of others.

Transform Movement Into Dance

In conclusion, evaluation of children in dance should be viewed more as part of the learning process, not just as a measure of its success; and teachers must develop abilities in observation, analysis, and communication in order to reinforce awareness in their students. This kind of awareness then becomes the bridge not only for the development of skills and understanding, but also for the transformation of *movement* into *dance*.

Teacher Education for Elementary School Physical Education

Preparing students as elementary school physical educators is a topic of importance for physical education professionals. Its importance is highlighted by the fact that the Council on Physical Education for Children sponsored a conference on Preparing the Physical Education Specialist for Children in 1984 in Orlando, Florida. Three of the five articles in this section are from the conference proceedings.

The Content of an Elementary School Physical Education Program and Its Impact on Teacher Preparation

Kate R. Barrett

The content of our field symbolizes what we stand for and what we have to offer the education of children. Our graduates will have to make decisions about what children will experience, in what sequence, and about how skillful they want children to become. These are tough decisions; never before in our history have we had so many directions from which to choose. For example, we can choose among:

- Adventure
- Aerobic dance
- Aerobic exercise
- American country dance
- Basic movement
- Basketball
- Basketball basics
- Bean bags, sticks, and wands
- Beginning ball skills
- Breaking up space sensibly
- Challenging climbing capacities
- Creative dance
- Creative dramatics
- Creative movement
- Educational dance
- Educational games
- Educational gymnastics
- Eyes and fingers in motion
- Fitness trails
- Folk dance for fun
- Football fantastics
- Fun with ropes
- Hoopnastics
- Huckleberry beanstalk
- Modern educational dance
- Movement/dance
- Movement/games
- Movement/gymnastics
- Parachute play
- Partner gymnastics
- Rhythmic movement for fun and fitness
- Rope courses
- Rope jumping
- Simple soccer skills
- Sittercises
- Softball strategies
- Sticks, paddles, and things
- Tinikling for fun and fitness
- Tennis tactics
- Ultimate frisbee
- Volleyball requisite skills
- Working in your own target zone

How do you react to this list? My reaction is that any profession that defines its content to include so great a range needs to reevaluate its purpose for being and, ultimately, its justification as a required subject in a child's curriculum.

For some reason we have become hesitant, perhaps reluctant, to think critically about our content. Instead, we adopt the "in" terminology or the "going thing," without understanding what it really means, where it came from, and most important, where it could lead us. It is time to accept the fact that our

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content has become too diverse to give us the direction needed to design programs that could be considered essential to a child's elementary school education, and one effect has been the weakening of our teacher preparation programs.

The purpose of this presentation is to address the topic of elementary school physical education content and its impact on teacher preparation. The impact is obvious, whatever you believe the content of physical education for children to be is the central idea around which you design teacher preparation experiences. What is not so obvious, is how to decide what should be the content. With the diversity so apparent, how do you make this decision?

My answer to this question will center around three suggestions: (a) recognize *movement* as physical education content rather than a term used to designate a curriculum area or group of experiences; (b) accept the development and performance of skillful movement as the primary purpose around which curriculum should be designed; and (c) make content decisions based upon a comprehensive movement analysis.

The Content of Elementary School Physical Education

Movement as Content, Not as a Curriculum Area

It seems time to accept the use of the term *movement* to describe the content of elementary school physical education and eliminate its use as a term to designate a particular area of the curriculum. This means that the historically accepted terms of *games* or *sports*, *dance*, *gymnastics*, *aquatics*, and *fitness* or *exercise* would be used specifically to describe the major organization of the program not to imply any specific content or methodology. You would not list or give a percentage of time to something called *movement or movement activities*, you would not have *movement lessons*, rather you would have *games lessons*, *dance lessons*, *gymnastics lessons*, *or aquatics lessons*.

Viewing movement as the content, thereby cutting across all areas of the curriculum, is going to be difficult since this is not the predominant view held by our profession. Support for this position comes from reviewing elementary school physical education textbooks from 1900 to the present and recent curriculum literature related to describing and analyzing program models and approaches. Based on this review, my conclusion is that movement is the subject matter of our field even though many authors do not specifically identify it as such (i.e., they do not use the word *movement*). While much of what was described as content was termed *activities* or *exercises*, all required learning and performing motor skills to meet their purpose. While the word *movement* was not used by authors to describe content, it was a term freely used at the turn of the century by some of our authors (e.g., Bancroft, 1896 and Halsey & Skarstrom, 1919).

This view is also meant to replace any terms that have been assigned to describe a particular approach to a program (Siedentop, Herkowitz, & Rink, 1984) or a particular curriculum model (Jewett & Bain, 1985). Siedentop, Herkowitz, and Rink identified five approaches to elementary school physical education curriculum design: eclectic, movement approach, sports, recreation, and fitness; and Jewett and Bain identified seven physical education curriculum models: developmental education, humanistic physical education, fitness, movement education, kinesiological studies, play education, and personal meaning.

In these models and approaches, the authors appeared to interpret movement as content only in the movement approach, the movement education model, and the kinesiological studies model. Studying specifically what is described as the content in each of the seven models and five approaches indicated again that the learning and performance of motor skills was an inherent and central dimension of each.

Not recognizing movement as the actual content is puzzling and could restrict the growth of any model or approach, certainly where the content dimension is concerned. What is not made clear either in the textbooks or in the models and approaches, and which may be the (hidden) critical difference, is the level of motor skill development sought as an outcome. What is clear is that movement or motor skill learning is the basis of all program experiences. What gives each approach or model distinction and potential for choosing it, are the assumptions upon which each is based and for what purpose(s) movement is used, not whether the content is identified as movement or as activities.

If you can accept movement as content, and you understand how it is structured for the unique demands of games and sports, dance, gymnastics, aquatics, and fitness, this perspective will allow you much freedom in making decisions about content in relation to an actual program. Diversity will exist, but its range will be controlled by a common commitment to understanding movement and how this understanding acts as the foundation upon which content is ultimately identified and sequenced to form a total program.

Commitment to Skillful Movement

I think it is critical that we accept the development and performance of skillful movement as the primary goal around which an elementary school physical education program should be designed. Why? Who else has the knowledge and skills to truly accomplish this, and who best understands the value of physical activity? I do acknowledge that this is a debatable issue and one I hope will be addressed throughout the conference as appropriate. Without taking a position on this issue, teacher preparation experiences will be designed in a vacuum. For the duration of this presentation, I am going to ask that you support the position that development and performance of skillful movement is the central purpose of children's physical education.

This position accepts that children have potential for skillful movement, that they want to become as skillful as they can, and that it is our responsibility to help them accomplish skillful movement. By using the term *skillful movement* or *skillful mover* it should not be interpreted that I support an "elite-skilled-performance orientation" (Phillips & Clark, 1984), because I see that as totally inappropriate for an elementary school physical education program. Being able to help *all* children refine and extend their present skill level, however, is a responsibility we must accept.

Furthermore, my emphasis on skillful movement should not be construed as a lack of commitment to cognitive and affective learnings. Indeed, quite the opposite, I believe movement, affective, and cognitive learnings to be an integrated experience, but I see the development of skillful movement to be the medium through which this occurs. For example, it is difficult for children to get excited about the feel of a movement or why it was effective or ineffective, if they are not skilled enough to feel the excitement or skilled enough to become curious about why the movement was or was not effective.

For the next section of my paper, I shall be referring to games, dance, gymnastics, and aquatics as the broad areas of the curriculum, eliminating the terms *sports* and *fitness*. I am using games in the broad sense and, as yet, I do not accept fitness as a separate curriculum area, but rather as a desired outcome influenced by the way the actual class experiences are designed. Fitness is an important component of the total program; about that I have no question. But, how to handle fitness realistically, coupled with a commitment to skillful movement, is still a question research has not asked.

Movement Analysis

To make actual decisions about what to teach, all teachers should have an approach to analyzing movement that is comprehensive in nature, one they understand, and one they can apply to all areas of the curriculum. Being comprehensive helps teachers see "the whole thing" of what they are teaching and sense what their field is about. Understanding their field gives teachers the rationale for making decisions about what to teach and why. Applying it to all areas of the curriculum gives the program unity, continuity, and breadth. The two models that follow have been selected because they are implicitly or explicitly a part of our current literature, in part or in their entirety. They are not new; rather, they are underdeveloped. Figure 1 illustrates Model A and Figure 2 illustrates Model B.

Model A had its beginnings in 1924 and is closely associated with the history of American kinesiology and motor development (Atwater, 1980; Barrett, 1983, 1984). Model B had its beginnings around 1940 and is associated primarily with the history of dance in England (Laban, 1963). Both models were originally conceived and designed specifically to help teachers organize and select material for teaching and to give guidance and focus to their work. Model A was developed originally for the specialized skills of daily life, work, sports, and dance (M.R. Broer, personal communication, May 31, 1984; National Association for Physical Education of College Women, 1964) and Model B was developed for modern educational dance (Laban, 1948, 1963; Preston-Dunlop, 1963, 1980). Both models offer sound ways to analyze movement for teaching today, and

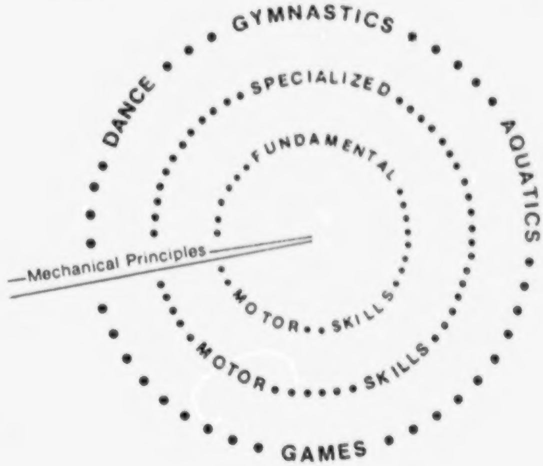

Figure 1. Model A. Used for analyzing movement from a skill perspective (Broer and Zernicke, 1979; Halverson, 1967; NAPECW, 1964; Wickstrom, 1983).

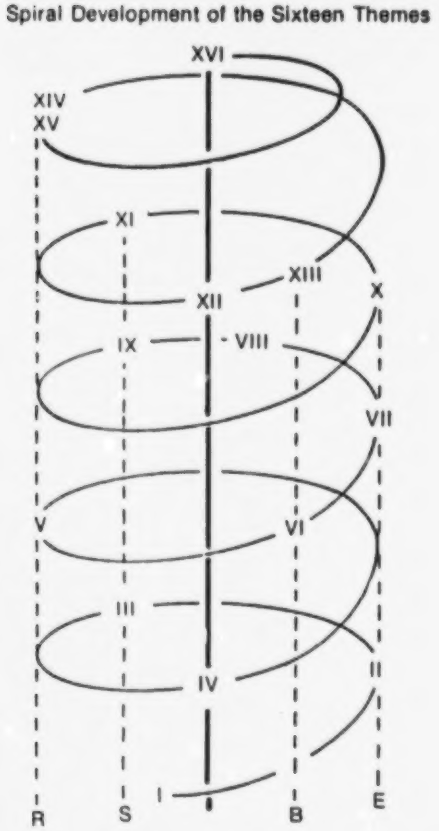

Figure 2. Model B. Used for analyzing movement from a conceptual perspective (Preston-Dunlop, 1980).

when understood can be applied to the selection and organization of content necessary to develop skillful movement in games, dance, gymnastics, and aquatics. More importantly, they respect different viewpoints about how movement might be analyzed.

Model A. Model A analyzes movement from a skill perspective. It supports the position that specific motor skills can be identified and organized in a hierarchical manner and are of two types: fundamental (basic) and specialized (Broer & Zernicke, 1979; Halverson, 1967; NAPECW, 1964; Wickstrom, 1983). This model recognizes that fundamental and specialized motor skills can be identified in all areas of the curriculum and that specialized motor skills are dependent upon the development of fundamental motor skills if they are to be applied effectively to the more advanced environments. The model makes specific the important and integrated role that mechanical principles play throughout the entire process; they must be observed for efficiency at both levels (M.R. Broer, personal communication, May 31, 1984). Implicit in this model is a belief that all movement skills are not unique in that certain basic movement patterns exist. This is explained by Broer and Zernicke (1979):

> As various skills are analyzed from the standpoint of the mechanics involved, it becomes obvious that there are some basic patterns of movement that require only slight adjustments according to the various purposes. (p. 8)

They further state:

> There is not one basic pattern of movement for any activity; there is a pattern for maximum force production and this is adjusted as less force is required to accomplish the specific purpose.... Good form is not a set pattern but rather the movement, or movements, which accomplish the purpose with the least expenditure of energy. (p. 29)

Understanding these concepts is important in using Model A because they aid you in organizing and teaching content. They alert you to look for the relationships between different movements of the body, across and within different movement forms, and to teach them.

Using any model, you must be able to apply the meaning of the terms associated with it. That of course takes study and would influence specific experiences designed as part of your teacher preparation curriculum. The following sections describe how I am currently defining these terms.

1. Fundamental (basic) motor skills—common motor activities with specific patterns. They are general skills that form the bases or foundations for the more advanced and more specific motor skills, as they may be required to be used in games, dance, gymnastics, and aquatics. Examples include running, jumping, throwing, catching, and twisting (NAPECW, 1964; Wickstrom, 1983).

2. Specialized skills—advanced and refined versions of a fundamental motor skill that are used in a particular way in a particular situation in games, dance, gymnastics, or aquatics (Wickstrom, 1977; 1983) and learned for the development of increased ability in the use of time/space/force relationships (H'Doubler, 1970, 1962). This implies modification or the combinations of fundamental motor skills (and changes in time/space/force relationships) essential for attaining specific goals for particular purposes (Halverson, 1967; NAPECW, 1964).

3. Mechanical principles—application of mechanical principles that apply to effective performance of fundamental and specific motor skills. This term is not meant to imply any specific set of tasks or content, but rather, the continued use of the information as a knowledge base upon which the teacher observes, interprets what is seen, and then makes decisions about how to continue (NAPECW, 1964; Roberton and Halverson, 1984).

For those of you who are unfamiliar with the history of Model A, the elimination of the "basic movement" component and the updating of the definitions are the major changes. Removing "basic movement" was done purposely because I question whether it is a useful concept when applied to analyzing movement for teaching children. It should be noted that the original model was designed to teach a fundamentals of movement course to college women (R.B. Glassow, personal communication, July 17, 1984). Basic movement is a concept we have used for approximately 30 years, and I feel it is misunderstood, misused, or inappropriate when applied to elementary school physical education. To me, it has become counterproductive to progress. I abandoned it approximately 10 years ago.

My decision to eliminate the term *basic movement* was influenced by reviewing the literature and the history of this particular model (Barrett, 1983, 1984), and especially by my recent correspondence with Marion Broer, its originator. The basic idea, she wrote, was "to recognize that there were Basic Movements available to the body, flexion, extension, rotation, circumduction, adduction, and abduction, that were the foundation or tool upon which various fundamental motor patterns could be developed" (M.R. Broer, personal communication, May 31, 1984). Today, this interpretation in elementary school physical education textbooks cannot be found; basic movement has become a fairly large collection of material, some of which, by my current definitions, would be considered fundamental motor skills and some specialized skills. No apparent rationale for sequencing it or for its relationship to skill development is evident.

It seems to be assumed that by participating in experiences designed with basic movement as their content, a child would be better prepared for the more complex skills required by advanced work in games, dance, gymnastics, and aquatics. This assumption relates to the concept of transfer, though not specifically stated as such. To avoid this debatable assumption being carried into the modified model, I am suggesting that a separate analysis be made for each curriculum area so that right from the start a direction in terms of movement form is established. Analysis would begin with what you consider to be fundamental skills and specialized skills *for* games, gymnastics, dance, and aquatics—separately. When this task is completed you have the beginnings of a program. The model actually would be used four times and requires that you be knowledgeable about the movement or motor skills inherent in each area.

This type of analysis has the potential to improve the way content is identified and sequences for each area—it should be clearer (a) where we are heading, (b) why we are going there, and (c) what it is we want children to experience. The quality of our content should improve as we begin to understand the richness in each area. As we come to understand our content better, the relationships that do exist among skills and across movement forms will emerge.

Model A has been presented first because it is the one we use the most, knowingly or unknowingly, but with a certain lack of sophistication. The problem rests with recognizing that for the development of specialized skills we must create content so the modifications and refinement necessary for a fundamental skill to become a specialized skill can occur. We have not done this. For example, it is still assumed in today's approaches to games teaching in elementary school texts that fundamental skills will become specialized skills simply by using them in the context of the game in question. In 1937, Dorothy La Salle recognized the need for special experiences designed especially to handle this problem. She designed a system for analyzing skills found in games (La Salle, 1937, pp. 122-127) and showed "how games increase in difficulty by the addition of skills" (p. 120).

In his 1951 book *Psychology of Coaching*, Lawther wrote of a skill having "meaning" in a sport. For example, about baseball he wrote, "each throw has a specific nature in terms of the game situation" (p. 122). In terms of coaching sports, he suggested that the "content" in courses should include "the basic skills, the fusion of the skills into action patterns, and the fusion of the action patterns into offensive and defensive play" (p. 128).

To create this content, it requires analyzing *how* the fundamental skill must be "modified" and "refined" so they can be used effectively in increasingly complex environments—in games, dance, gymnastics, and aquatics. This is done by analyzing the environment and the time/space/force (H'Doubler, 1960, 1962) demands that these environments have on the fundamental skills. It is not within the scope of this paper to say that these concepts were a part of the original 1964 model (NAPECW, 1964) and were linked directly with H'Doubler's work (1960, 1962). Figure 3 shows the particular aspect of her model that was applied.

Library research and a personal interview with a student of H'Doubler's and a recent student of "Laban's

	SPACE - TIME (A FOUR DIMENSIONAL CONTINUUM UNITING THE THREE ELEMENTS OF SPACE (LENGTH, HEIGHT, WIDTH) AND ONE OF TIME)																									
	SPACE (AN EXPANSE EXTENDING IN ALL DIRECTIONS. THE BODY EXISTS IN SPACE AND MOVES THRU SPACE																TIME (INFINITE DURATION MOVEMENTS TAKE PLACE IN TIME)				FORCE (WHEN MUSCLE ENERGY IS RELEASED MOVEMENTS ARE PRODUCED HAVING VARYING DEGREES OF FORCE					
	DIRECTION (PATH TAKEN)			BODY FACINGS				LEVELS (RAISED OR LOWERED CENTER OF GRAVITY)			RANGE (DISTANCE COVERED)			FOCUS (A POINT OF CONCENTRATION)			SPEED (RATE AT WHICH MOVEMENT INTERVALS PROCEED)			INTERVAL DURATION (THE RELATIVE TIME LENGTH OF SUCCESSIVE MOVEMENT INTERVALS EXPRESSED IN LONGS & SHORTS)	MAGNITUDE (AMOUNT OF FORCE)			DIRECTION (LINE OF FORCE)		
ACTIVITY	STRAIGHT	CURVED	ZIG-ZAG	FORWARD	BACKWARD	SIDEWARD	TURNING	HIGH	MEDIUM	LOW	SMALL	MEDIUM	LARGE	INWARD	OUTWARD	COMBINATION	SLOW	MODERATE	FAST		SMALL	MODERATE	GREAT	VERTICAL	DIAGONAL	HORIZONTAL

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Figure 3. A guide for the analysis of movement — dynamic considerations (H'Doubler, 1950).

Movement Analysis" (Bartenieff, 1980) revealed that there are many similarities between these works, but the differences that do exist are important to understand (Barrett, 1983, 1984; M. A. Brennan, personal communication, July 18, 1984).

My point is, that while Model A is the oldest of the two being presented, it may be the least developed in terms of its use for children's physical education although it has the potential to be the most powerful. It certainly warrants renewed attention. As you work with this model, you will come to realize that it draws explicitly from motor learning and motor development as additional bodies of important knowledge, both of which have advanced considerably since 1964. For example, task analysis helps you to analyze the way a fundamental skill is to be used in a particular situation, and hence "discover" important content. Knowledge of how fundamental motor skills develop over time gives a powerful observation and assessment tool to evaluate children's progress. How to use this information to design experiences for children that will elicit the desired responses is pedagogy, and another subject altogether.

Model B. Model B analyzes movement from a conceptual perspective. The term *concept* is used to connote a motor or movement outcome, not a cognitive one, and is interpreted to mean a group of skills organized around a common idea. Such concepts would include "traveling" as opposed to a specific type of travel, "catching" as opposed to a specific type of catch, or "balancing" as opposed to a specific type of balance.

Model B supports the position that movement can be analyzed conceptually and that an order of these concepts exists that indicates how skill in movement develops over time. This attention to progression is operationalized by ordering all movement concepts into what originally was called Sixteen Basic Movement Themes (Table 1) and was first published in this form in 1948 by Rudolf Laban. The model, in reality Preston-Dunlop's interpretation of the relationship between and among the material within the themes, was first published in 1963 and revised in 1980.

Notice that each theme, designated by the Roman numerals I-XVI, has a specific place along the spiral in Model B(see Figure 2). The rationale behind the themes can best be explained by quoting Laban's original writings:

> The leading idea is that the teacher should find his own manner of stimulating his pupils to move, and later to dance, by choosing from a collection of basic movement-themes those variations which are appropriate to the actual stage and state of development of a pupil or of the majority of a class. The collection is built up along a scale of increasing complexity corresponding roughly to the development of the child from the infant stage to the highest age-group. (Laban, 1963, p. 28)

On the specific subject of how the first eight themes might actually be used, he pointed out:

> Each basic movement-theme or their variations can be combined with each other; others may be joined with one another through transmutations of their details. The movement ideas contained in one theme need not be fully assimilated by the pupil before another theme is started. Movement ideas can develop parallel to each other, and some teachers might find in relatively advanced themes details which they may use as an incentive in comparatively early stages of dance tuition. On the other hand, the most elementary movement themes will remain valuable even for the highest age-groups. (Laban, 1963, p. 28)

To use this model, the material in the themes must be understood before the application process begins. It is beyond the scope of this paper to go into detail regarding the material inherent in each theme since the brevity of the discussion would only undermine its richness. A discussion of the material inherent in one theme is given as an example of how the material is described and how progression is perceived as an integrated idea. Table 1 gives the major emphasis of the Sixteen Basic Movement Themes as currently revised by Preston-Dunlop (1980). I have chosen to discuss Theme IV: The flow of the weight of the body in space and time.

Flow, as described by Preston-Dunlop (1980, pp. 26-30) is perceived as having "three strands," and the simplest strand is continuity, or "the way movements follow each other." In her words:

> If the movement is continuous, without starts and stops, it has continuity and is loosely said to be flowing on. If the movements stop and start, the sequence is discontinuous. It is said not to be flowing on, but to be interrupted. (Preston-Dunlop, 1980, p. 26

Theme I	Introduction to the body
Theme II	Introduction to weight and time
Theme III	Introduction to space
Theme IV	The flow of the weight of the body in space and time
Theme V	Adaptation to a partner
Theme VI	The instrumental use of the body and technique
Theme VII	Dynamics through the basic effort actions
Theme VIII	Occupational rhythms
Theme IX	Shape in movement
Theme X	Dynamic rhythms and effort transitions
Theme XI	Orientation in space
Theme XIII	Body, action, effort and space affinities
Theme XIII	Elevation
Theme XIV	Group feeling and group composition
Theme XV	Group formations
Theme XVI	Meaning, expression, communication, and embodiment

Table 1. Sixteen Basic Movement Themes

The second strand, she points out, is concerned with "the way the movement flows through the body." In her words:

> It flows successively through the body if the activity can be seen and felt to pass from one body part to another adjacent part in succession. It flows simultaneously throughout the body if the activity can be seen and felt to happen in all the moving body parts at the same time. (Preston-Dunlop, 1980, p. 26)

The third strand, free and bound flow, is concerned with "the way in which the movement is controlled or not controlled" (Preston-Dunlop, 1980, p. 28). Quoting Laban directly in her explanation:

> In an action in which it is difficult to stop the movement suddenly, the flow is free or fluent. In an action capable of being stopped and held without difficulty at any moment during the movement, the flow is bound. (Laban, 1963, p. 56)

Flexible and direct space qualities are discussed in detail followed by the four motion factors as continuums and the two-motion-factor qualities. In these discussions, it is clear that she is bringing forth material that was a part of earlier themes, particularly Theme II. She concludes her discussion by indicating that, while there is new material in this theme, its main aim is "to integrate the work of the preceding three" (Preston-Dunlop, 1980, p. 37). This is done by attending to the phrasing of the movement combinations as they are joined together in terms of "transitions, appropriateness, beginnings, and endings" (Preston-Dunlop, 1980, p. 39).

Model B can be used to analyze the movement demands inherent in games, dance, gymnastics, and aquatics and to organize it progressively since the material inherent in the earlier themes is considered less complex than the material in the later ones. When this task is complete, you have the beginnings of a program. Skillful movement as a commitment is explicitly a part of this model.

The theory of movement around which this model is built is the concept of "economy of movement" (Laban & Lawrence, 1974) and is its very essence. Identifying and sequencing movement analyzed using this model assumes a commitment to the goal of skillful movement, evident by the spiral concept and the sophisticated theory of progression inherent within the model.

Analyzing movement using this model should improve the way content is identified and sequenced for each of the major curriculum areas. Where we are heading, why we want to go there, and what is it we want children to experience, should all become clearer to us. Model B supports the belief that relationships exist between movement concepts and across and between movements forms. These emerge, however, only as you come to understand movement analyzed from this perspective.

This model was presented second because it is the one least aligned with the way movement is currently being analyzed in the profession. While there are some attempts to use part of this model, the model with the spiral concept of progression as presented here has had limited use. This could be due, in part, to the fact that each generation using it has had less and less understanding of its meaning, or because it was originally used with too limited an understanding or too broad an application too early. There is still a lot of work that can be done to release the potential in this model for identifying and sequencing content to form a total program. Again, how to use the model in designing experiences and to elicit the desired responses is pedagogy.

Separating Pedagogy and Content. Notice that I have ended the sections describing each model with the concept that pedagogy is an idea separate from content. If we are to become more sophisticated in the way we view our content, there is no question that this must occur. Admittedly, content and pedagogy are related ideas, but the role each plays in designing and implementing quality experiences for children is significant enough for each to be studied separately. This may be difficult, for we have viewed them together since the early 1900s when elementary school physical education textbooks were first published; certain content implied certain methodology (Halsey & Skarstrom, 1919; State of Michigan, 1919; Wild & White, 1924).

As we now have accepted pedagogy as an area for study and research, it seems the time to separate them. In fact, this step could be a key factor, if not *the* key factor, in helping to untangle the question of content, because they are often perceived in much of our literature as inseparable. The most consistent example of this is the linking together of Laban's principles of movement with problem-solving methodology. If we want to advance our thinking about content and pedagogy, content must be perceived as having its own identity.

Impact on Teacher Preparation Curriculum

Once a commitment has been made to the content of an elementary school physical education program, what are the implications for teacher preparation? Because the rest of this morning's speakers are focusing directly on this subject, my comments are limited to those implications which I feel relate specifically to movement as the content of an elementary school physical education program and skillful movement as its primary emphasis. My comments purposely are narrow in scope.

First, there is no question that our students must be turned on to their subject matter. In 1972, Locke said this well in his closing address at the first National Conference on Professional Preparation of the Elementary Specialist:

> Many students graduate who really care very little about their experiences in movement. They never have placed much value on those experiences and certainly have never thought deeply about them. Teachers like that can become contributors to the endemic disease of physical education — dullness. An exciting teacher in any subject is one who is turned on by his sport.... In physical education there is no substitute for getting pleasure from movement, satisfaction from mastery, and excitement from the struggle.... If your graduates are going to get children high on sport and dance, they must be hooked on

> movement themselves. The corollary of the fact for both teacher education programs and teacher educators is too obvious to miss. The meaning and joy of effort in movement must be held at the center of professional life. (p. 99)

What Locke said in 1972 is as true today as it was then, with possibly one exception—the genuine excitement that some of our students get from running and working out. But as a physical educator responsible for educating children into a potential field of lifelong learning and participation, this seems too limited. As one of our teaching assistants recently put it when asked to express her perceptions of our students in her basketball class: "They have no attitude about movement or learning movement. I don't think they know why they're here."

In terms of the professional preparation program, learning experiences must be developed specifically to help students enjoy moving, no matter the form. Children love to move, and love to learn how to move. My worry is that our graduates could turn children off rather than capture their natural love and talent for moving. As teacher educators, we must make this a priority objective within our programs, with learning experiences and evaluation techniques specifically designed to meet it. I see the "activity" part of our program as the major means to accomplish this. To be of value, however, the course work, or the activity experiences in this case, must link directly with the view you take regarding the content of a program. I am referring, of course, to Model A and Model B.

Second, we must establish a focus on the importance of studying movement as it is needed for teaching children in physical education environments. There is little question that within the past decade the knowledge base in such areas as motor learning, motor development, kinesiology, biomechanics, and physiology has dramatically increased to the point where some serious reconceptualization of this knowledge for teacher preparation must occur. Phillips and Clark (1984) have addressed this problem as it related to kinesiology and have proposed "an integrative approach to teaching kinesiology: a lifespan approach" (p. 1).

One thing is certain, the course work that specifically relates to understanding movement and how children acquire skill must link directly with the view you take regarding the content of a program. This is not the case now, and it needs to be resolved. For example, when your students study the content of an elementary school physical education program, they must be able to draw on their kinesiology background, not wonder why they took the course. This example, while specific to kinesiology, is also true for all course experiences in which understanding movement and how children acquire skill are key emphases. If movement is truly our content, surely we should be able to make the link between course work that focuses on understanding it and course work that focuses on teaching or using it as the basis for program development.

Whether your content orientation reflects Model A or Model B, a sound knowledge base about movement for teaching is required. While there is some common knowledge about movement and how skill is acquired, which is needed to use both models effectively, the knowledge unique to each model must be identified, respected, studied, and applied. For example, in using Model A, faculty must accept and understand the concept of basic movement patterns and the role that maximum force production and purpose of the movement plays in their execution. Faculty must also be able to analyze the time/space/force demands of the environment to help make the transition of a fundamental skill into a specific skill in games, dance, gymnastics, and aquatics. In using Model B, faculty must be knowledgeable about Laban's principles of movement and how progression affects development of skillful movement when applying them in games, dance, gymnastics, and aquatics.

Third, experiences specifically related to teaching physical education must be designed to link concepts of skill development and knowledge of movement with specific teaching behaviors. This is a complex idea considering these behaviors must simultaneously reflect an understanding of movement associated with the model chosen for analysis and skill development. Regardless of the model used, graduates must be able to manipulate specific teaching behaviors related to eliciting skillful movement from children in realistic environments. This can only occur if their work in pedagogy is placed on a strong foundation of understanding movement and of the process children go through to become skillful at using it. To achieve this goal, a carefully orchestrated balance between movement knowledge and methodology must be found while simultaneously focusing on the development of skillful observation of movement and on the timing and design of quality field experiences.

Accepting movement as the content and development and performance of skillful movement as a major outcome requires that a significant part of teacher preparation focus on understanding movement and how children acquire skill at using it. It goes without saying that children must play an important and continuous role throughout the preparation process. For without observing children being taught by skillful teachers in programs consistent with your decision about content, or without having your students work continuously with children, there is no way the kind of program that must happen in the schools has a chance of developing. And, because we will always have important issues to discuss about the content of physical education and its central purpose for children, our students must make "philosophy their business," for their ability to think critically about these issues will influence the future of the field (Miller, 1984).

We are at a turning point in our history: a clear decision about what is the content of elementary school physical education must be made. As a profession, we are currently uneasy about this decision, at least as it is being expressed in our literature. I feel it is time to acknowledge that movement is our content and limit the use of the term solely to describe the subject matter of our field — just as kinesiologists, motor learners, motor developers, physiologists, and philosophers do. If we can accept this concept, it can become a focus to orient us in a common direction.

It goes without saying that none of what I have said today is applicable if we do not think movement is our content or that skillful use of it is our central goal for children. If our content is something other than movement, and we want something other than skillful movement, this concept must be decided on before teacher preparation programs can be designed. Identifying our content and the central purpose of our program are decisions that should have the greatest impact on teacher preparation.

References

Atwater, A.E. (1980). Kinesiology/Biomechanics: Prospective and trends. *Research Quarterly for Exercise and Sport*, 51(1), 193-218.

Bancroft, J.H. (1896). *School gymnastics: Free hand system of physical exercise for schools.* New York and Chicago: E. L. Kellogg.

Barrett, K.R. (1983). "Is our content theory theoretically sound?" In A.E. Jewett, ed., *Proceedings of the Third Conference on Curriculum Theory in Physical Education*, pp. 122-146. Athens, GA.

Barrett, K.R. (1984, June). Examining our movement content from a theoretical perspective. Paper presented at Physical Education in Early Childhood Conference, Vancouver, BC.

Bartenieff, I. (1980). *Body movement.* New York: Gordon and Breach, Science Publishers.

Broer, M.R., & Zernicke, R.F. (1979). *Efficiency of human movement* (5th ed.). Philadelphia: W. B. Saunders.

Halsey, E., & Skarstrom, W. (1919). School room gymnastics lessons. Wellesley, MA: Wellesley College.

Halverson, L.E. (1967, January). Children learning movement. Paper presented at the Conference for College Teachers Preparing Elementary Education Majors to Teach Physical Education, Washington, DC.

H'Doubler, M.N. (1960). *A guide for the analysis of movement: Structural considerations, dynamic considerations, quality considerations, rhythmic analysis.* (Available from Kate R. Barrett, Department of Physical Education, UNC-G, Greensboro, NC 27412).

H'Doubler, M.N. (1962). *Dance as a creative art experience.* Madison: University of Wisconsin Press.

Jewett, A.E., and Bain, L.L. (1985). *The curriculum process in physical education.* Dubuque, IA: Wm. C. Brown.

Laban, R. (1948). *Modern educational dance.* London: Macdonald and Evans, Ots.

Laban, R. (1963). *Modern educational dance* (rev. by L. Ullman). London: Macdonald and Evans.

Laban, R., & Lawrence, F.C. (1974). *Effort: Economy in body movement* (2nd ed.). Boston: Plays.

La Salle, D. (1937). *Physical education for the classroom teacher. New York*: A.S. Barnes and Co.

Lawther, J. (1951). *Psychology of coaching.* Englewood Cliffs, NJ: Prentice-Hall.

Locke, L.F. (1972). Teacher education: One minute to midnight. In *Preparing the elementary specialist, a report of the proceedings of the National Conference on Professional Preparation of the Elementary Specialist*, pp. 87-103. Washington, DC: American Alliance for Health, Physical Education, and Recreation.

Miller, D.M. (1984). Philosophy: Whose business? *Quest*, 36(1), 23-36.

National Association for Physical Education of College Women. (1964). No limit to dimensions. 1962 Biennial Conference, Aesthetics and human movement, 1964 Ruby Anniversary Workshop. Washington, DC: American Alliance for Health, Physical Education, and Recreation.

Phillips, S.J., & Clark, J.E. (1984, January). An integrated approach to teaching kinesiology: A lifespan approach. Paper presented at the Second National Symposium on Teaching Kinesiology and Biomechanics in Sports, Colorado Springs, CO.

Preston, V. (1963). *A handbook for modern educational dance.* London: Macdonald and Evans.

Preston-Dunlop, V. (1980). *A handbook for modern educational dance* (rev.). Boston: Plays.

Roberton, M.A., & Halverson, L.E. (1984). *Developing children—Their changing movement.* Philadelphia: Lea & Febiger.

Siedentop, D., Herkowitz, J., & Rink, J. (1984). *Elementary physical education methods.* Englewood Cliffs: Prentice-Hall.

State of Michigan Department of Public Instruction. (1919). Physical training course in physical training for the graded schools of Michigan. Bulletin No. 2 (3rd ed.). Lansing, MI: Superintendent of Public Instruction.

Wickstrom, R.L. (1977). *Fundamental motor patterns* (2nd ed.). Philadelphia: Lea & Febiger.

Wickstrom, R.L. (1983). *Fundamental motor patterns* (3rd ed.). Philadelphia: Lea & Febiger.

Wild, M.R., & White, D.E. (1924). *Physical education for elementary schools*. Cedar Falls, IA: Iowa State Teachers College.

Beyond Pedagogy

Marion Alice Sanborn

After many weeks of work on this paper, including numerous re-readings of the charge given to today's speakers, I came to the conclusion that I would not be able to satisfy the charge. Even so, there was much I felt needed to be said from the point of view of a practicing teacher. I ask your forbearance and shall plunge ahead with the hope that what I say does not turn out to be another book on turtles.

I'm referring to the young lad who peered at the librarian over the circulation desk and asked for a book on turtles. She produced a lovely volume for him and he took it away, only to return very shortly and hand it back. To her query, he replied, "This book has more about turtles than I want to know."

The original title given me is Job Skills: Beyond Pedagogy (administrative tasks, conferencing skills, etc.). There is so much more to being a teacher than pedagogy and other job skills. I will cover some skills and then I will launch into the etcetera, which opens the whole world of public elementary education. My remarks will cover some of the skills, attitudes, and understandings which lie between pedagogy and feelings of satisfaction as a teacher.

Table 1 shows the areas that I expect to cover and the four parts of the assignment given. I'm going to deal globally with the four parts. The contribution of the content I will be discussing is to the survival of the teacher in the educational setting. You are going to have to determine its place in the professional preparation program

Regarding arguments for including certain coursework in a professional preparation program: I don't often shy away from pro and con presentations, but the last time I did so for the sake of clarity and enlightenment, I was firmly on the pro side, and the recipients not only decided for the con, but used all the arguments I had given them. They did not even give me the courtesy of coming up with one new argument! I believe that what I have to say is important. I may give you arguments for including coursework, but I will most certainly not give you arguments against it, with the one exception of the great cop-out, current practice, "It's always been done this way."

My time for the better part of the past twenty years has been spent in the elementary schools and my energies have been expended in trying to learn to teach in ways that I was not taught and in trying to understand what was happening. I have had to figure out things for which I was not prepared, many of them factors that have discouraged others to the point that they have left teaching. I have been away from professional preparation too long. I'm not sure how to conduct a course containing this content. I do know that the purpose of teaching it is, purely and simply, the survival of teachers. I also am not sure how content should be taught to meet the needs of the elementary physical educator. You will have to figure this out for yourselves.

I did my scholarly part in the library. I've photocopied the appropriate articles and read them carefully. But I didn't learn much and the slant wasn't quite right. I finally realized that outsiders were examining microscopic bits of a whole they did not fully understand and could not until they had lived with it for a

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Table 1.

The assignment:

1. Contribution of content area to professional preparation program
2. Arguments pro and con
3. Conduct of course containing content for what purposes?
4. How content will be taught to meet needs of elementary physical education

The approach:

Skills:	**Attitudes:**	**Understandings:**
1. Administration	1. Professional	1. Professional isolation
2. Conferencing	2. Positive	2. The hardest job
3. Curriculum planning	3. Future voters	3. Greatest opportunity
4. Intramurals and playgrounds	4. See children/individuals	4. Behavioral objectives
5. Healthful lifestyle	5. Appreciation of young	5. Accountability
6. Individual help	6. Competition/cooperation	6. Political realities
7. Public relations	7. Admit mistakes	7. It doesn't matter
		8. Unknown wilderness

Rest of charge:

very long time. We need this examination, but at least let us do it in partnership with one another. I also realized that you asked a public school teacher to speak, not to do what any library researcher could have done, but rather for the unique perspectives that might bring new ways of looking at elementary teaching. Here, then, are my perspectives.

SKILLS

Administrative Tasks

The principal administrative jobs are scheduling, budgeting, and ordering equipment. It is the responsibility of the principal to prepare a building schedule and see that it is fair to all concerned. Unfortunately, many principals have neither an interest in nor an aptitude for making out schedules. But the major problem in schedule-making occurs when the principal has not been an elementary specialist, for then he/she has no appreciation for the tremendous effect the schedule has on the specialists' lives.

When we teach at the university level, we frequently work with schedules that are less than we hoped. But they only last for a term. And within that schedule, we still have a lot of flexibility, at least until we allow ourselves to get overloaded. It's different at the elementary school. The schedule lasts for 36 full weeks—almost ten months. And there is practically no free time in that schedule and very little flexibility.

If the schedule is poor, we are locked in for one entire, not so professional, year. When we have a kindergarten class between two sixth grades, followed with second, then fifth, and so on, it is difficult to give our best. When classes are not blocked together so that we can plan equipment changes, it is difficult. When our classes are run together so that one group is waiting at the door while we try to bring sensible closure to the other group after Suzy just tripped Ryan and his eyeglasses broke when he fell, it is difficult. Most elementary specialists could go on and on about the problems and horrors of poor schedules. Suffice it to say that there is little flexibility and no escape. Like the students who don't want to be there, teachers also are prisoners for the remainder of the school year.

There are ways to avoid poor scheduling. I have found some principals who are willing to accept help with the total school schedule if that help is offered quietly and if the teacher keeps quiet about it afterwards. I tell them that I enjoy working out schedules as much as I enjoy jigsaw puzzles (and I do). When the principal is not receptive to this kind of help, at least we can plan our own most desirable schedule, have reasons ready for our requests, and take time to explain these to the principal before the schedule is made. Knowledge of how to schedule should be basic someplace in the undergraduate curriculum. Let us not, as with the principal's preparation, leave it to chance.

Budgeting for equipment is not always an option for the teacher. Usually, the teacher is informed about the amount available. After assessing the equipment on hand and needed, it is the job of the teacher to let the administrator know what is needed and why. Failure to communicate why is probably the single greatest cause of underequipped programs. Perhaps there won't be results the first year, or even the second, but courteous persistence and optimum utilization of what is available frequently will secure the results.

Once money is available, knowledge of how to prioritize is essential. It is ridiculous to purchase an item for one time use when there are greater needs.

Teachers should be aware of the fiscal calendar. In different school settings, I have secured extra equipment by having the right information on ordering when someone calls and says "I have $200 or $300 that has to be spent in the next thirty days. Do you need anything?"

The skills of ordering equipment must not be overlooked. Equipment, catalogues, and companies need to be evaluated. It may cost less to order from one company, but if half the balls won't hold air, will they take them back? You need service as well as price. Also, if the bill must be paid in 25 days, you want delivery next Monday along with the bill. Once the bill is in, see if there is a way to get it paid immediately.

The care of equipment is also an essential skill, but some of that should be included in curriculum content, because we must teach our children to care for equipment. If it isn't in the school curriculum, it should be. Teaching children to care for equipment can mean a threefold increase in the amount of equipment available at any one time.

Conferencing Skills

Conferences can be classified as formal and informal and as those held with students, parents, and professionals. As much as possible, we need to know ahead of time what is to be said at a conference. If there are doubts about the suitability of subjects, check it out! I don't need to tell you what the conferencing skills are, only that they are important to beginning teachers. Professional students need practice in conferencing. They should be asked to outline areas to be covered with hypothetical and real cases and to write sample openings for conferences. They need this exposure for conferences with all three groups and probably with the press. We never know when talking with the press is a likelihood and nothing happens easier than foot in mouth in publication — nor is there anything more devastating. Mock conferences should be held and evaluated.

Perhaps the most important conferences of all are those with the principal and the personnel director. These conferences will determine job securement, job retention, and, to a great extent, job satisfaction.

Physical educators have many opportunities to counsel students informally. They need to know how to handle these situations and to keep principals and classroom teachers informed. Whether they like it or not, physical educators will be dealing with personal and family problems that children bring to school in increasing numbers and complexity. Teachers must be prepared to respond to changes in children, both of the moment and changes resulting from maturation.

Just as we teach children that when they leave school or talk to visitors, they represent themselves, their parents, and their school, we also need to help prospective teachers understand that they represent themselves, their principal and fellow teachers, and their school district. There is merit in the term "best foot forward." I am not saying that everyone should cover up, but the general public does not need to know every little thing that goes wrong in school and teachers need to know this. Ethical behavior should extend to the teachers' lounge. Gossip is not just a time-waster; it is fuel for the fires of envy and soil for the seeds of discontent.

Curriculum Planning

Those of you who know me well, know how dear to my heart is the process of "Messing About." What a marvelous concept David Hawkins (1965) has given us. I believe our professional students need to study a lot of theory about curriculum planning, but along with that theory they need experience operating as a curriculum committee. They need the understanding that curriculum is "messy, man, messy." It is not linear and neatly progressive. It is plain and simply messy.

Personally, I believe that prospective teachers need to understand that most planning is messy and they should know that it is both legitimate and essential to mess about in their planning and in their teaching. Not mess around—mess about. Planning and teaching are not easy. Why should we make it more difficult by pretending that it is organized and linear and proceeds in outline form? That's bologna, and they need to know it.

Curriculum work is a skill. It involves give and take with people and the art of compromise. Workers need the ability to look for common ground, wherever that may be, because common ground is probably the best place to start developing a curriculum. Patience is essential in curriculum work, and impatience is counterproductive. Finding that common ground can take hours, days, and many meetings but failure to find it will result in an inferior product or no document. Leadership in curriculum must strike a balance. Too little direction results in much wasted time. Too much direction will get the job done but commitment and allegiance to the plan will be missing.

Organization and Supervision of Intramurals and Playgrounds

Responsibilities, possibilities, and techniques of organizing and supervising intramural activities should be an essential of undergraduate preparation for the elementary physical educator. Appropriate activities need to be discussed as well as appropriate behaviors of teachers conducting out-of-class activities. In addition, there probably isn't anyone in the school who can contribute as much to the playground as the physical educator. First, we have a responsibility to teach in our classes playground activities for each age level and appropriate playground behaviors. Our majors must be prepared to do this. Further, this is one area that should involve close cooperation between classroom teachers and physical educators.

Second, the design of the playground frequently falls to the physical educator by default. No one else knows what to do so they turn to the physical educator. If you believe as I do, that the time spent on the playground is an important part of each child's school day, then you will agree the playgrounds need to be designed accordingly. Our majors need to be prepared to meet the challenges of both design and supervision.

Establishing a Healthful Lifestyle

Using the words of the financiers, young professionals need to learn to "pay yourself first." In public schools, equipment and facilities are not as convenient to use as on college campuses, if for no other reason than that they are constantly in use by others, mainly public school students and the general community. Also, there is constant pressure on the physical educator to serve as organizer, sponsor, and promoter of recreational activities rather than to participate. For their own welfare, physical educators must schedule time for their own physical activities and guard it jealously.

It is appalling how much the elementary school drains the teacher. Good nutrition and adequate rest are important to all teachers. Having been both a classroom teacher and a physical educator, I know the latter is more demanding of physical, mental, and emotional energies. Many of us readily admit that lack of good sleep Sunday night means difficult children most of the next week. Children must have built-in sensors which home on teachers' lack of sleep and some of them have automatic, unstoppable, poor behavior as a natural reaction. If, on the other hand, we are relaxed and rested on Monday mornings and get plenty of sleep through the week, things go much better.

Individual Help

Every teacher has students who need extra help. But when it comes to identifying the children who need help, physical educators have not been as well prepared. Ask an elementary teacher if he or she has second graders who cannot skip. Nine out of ten will tell you "no." Then, watch the class. The key is to watch each child separately. More often than not, you will find several who cannot skip, much to the amazement of their teacher.

Children will benefit from extra help with motor skills just as they do with other academic skills. And the earlier the intervention, the less time and effort is needed to get results. The kind of problems with motor development that we can alleviate or correct can be spotted in kindergarten. If they have not been recognized by the end of first grade, we are failing the children.

I am not in the least opposed to providing extra help for intermediate children who need it. I frequently work with intermediate level children on skills such as throwing, catching, or guarding a goal. However, the same amount of time spent with primary children will bring far better results and can prevent those children from becoming physical education and playground dropouts. Of course there will be exceptions, but prospective teachers need to know that if they have to fight for time in their schedules to work with individuals, the younger the child, the more effective that help will be.

Following identification, what do we do then? How do we go about getting help for the children? How do we approach parents? "Your child is flunking gym?" I've had two sets of parents tell me that their children had negative feelings about failing physical education and they did not want to have extra gym. In both cases, it turned out that the parents had the negative feelings and by the end of a month the children knew they had a very special program that every student in class envied. If I go into a classroom to pick up a group for extra help and one child is absent, every child in the class will volunteer to take the absentee's place.

From the little I know of professional preparation programs today, it seems that we are probably doing an adequate job of teaching students how to work with children that need extra help. I certainly hope so, because the work not only is essential, it is highly rewarding.

Programs and Public Relations

I don't remember being told how important PTA and other display-type programs are to the elementary specialist, but they can make or break a teacher. Poor teachers can be forgiven a lot if they can put on a smashing program, and excellent teachers will suffer if they don't come through. The whys, hows, and wherefors of organizing such programs must not be foreign to beginning teachers. Techniques for utilizing class material, for planning and working with children, for getting the best from them, for dealing with poor rehearsals, for choosing student groups, and for seeing that all children have opportunities to perform are all essential. Most of these skills are assumed but many are frequently absent. Can we say we are preparing teachers if we ignore this job skill?

An extremely important part of public relations is keeping records and developing statistics. It takes precious time, but the rewards can be great. Teachers need to choose a few skills important to children and to themselves, find a way to give standard scores on these, and take the time to keep accurate records over several years. I have never been a big fan of testing, believing that teaching was far more important.

However, four years ago when we started the Intensive Physical Education for Primary Students (IPEPS) program, I realized the necessity for both testing and record-keeping. Perhaps we tested too much, but when the program was in full swing, I met the kindergartners every day the first semester and four or five days the second. First, second, and third graders had physical education three times each week and selected students had four periods per week. At the end of three years, we had statistics showing the benefits of the IPEPS program. At that time, the state of Ohio changed its standards to 200 minutes per week of art, music, and physical education for all elementary children. Our intermediate classes were in compliance but our primary children only had 150 minutes total, including 60 minutes of physical education. Because of the success of IPEPS and particularly because of the statistics, our principal, Jean Sylak, was able to convince the other principals to extend physical education to 90 minutes per week — a full 30 minute extension. Music was extended 10 minutes and art 10 minutes. Without those statistics, the missing 50 minutes would undoubtedly have been divided differently.

Teachers do not need large amounts of statistics to make their case, but the fitness tests are not enough. We need to show growth in skills and abilities that are important to the child and see that they are important to the parent.

A few weeks ago a parent of a new student came to me. She could not believe that her first grader had learned to turn a forward roll over a bar three feet high. "She is so unathletic" was the mother's comment. A few days later the daughter had a chance to show the new skill to her mother, who was delighted. Fortunately, the mother was receptive to new ideas. She took literature home, read it thoroughly, came back and said "I've done everything wrong!" She has completely revised her opinions on her two children and is working to allow them much more freedom. Previously she "had no idea!" This is public relations, and it was aided by other satisfied mothers encouraging the newcomer to our community.

ATTITUDES

Professional

Several years ago, a colleague described what happened when one of the old guard on the faculty no longer taught freshmen majors. She said that upperclassmen did not have that professional attitude that the retiree had been able to instill in the underclassmen. What makes the difference, I'm not sure, but I am very sure that whatever it is, it needs to be cultivated and carefully propagated.

I shall always be grateful to the tremendous faculty at Ohio State that I was privileged to learn from. They made sure that we understood that we were professionals, receiving a professional education. Not training, friends, education. Dogs are trained; professionals are educated. We understood that we were to behave as professionals.

I was never more grateful for this than during a heated discussion with a principal in Connecticut. I happened to be chair of the salary committee and he (management) thought teachers (labor) should be satisfied with things as they were. I was able to stand up to this because I understood that I was a professional and that regardless of what he said or did I intended to remain a professional in attitude, thinking, and actions. Friends, there is no substitute for the professional attitude. I do not know how to instill it. I only know that it must be a part of undergraduate preparation.

Positive

Teachers need to have a positive outlook. Negativism has little part in schooling. We are dealing with the future and if there is no hope out there, we might as well save our efforts. Optimism may be all we have going for us, but we better at least have that.

Future Voters

We are educating future voters and we don't want to lose one vote. We must look at our children and youth as potential voters, because they are. We have lost too many of them in the past. We cannot afford to continue doing that. If our students were going to vote next month on school finances, some of us would teach differently.

I know that "fun" as an objective has not recently been in favor, but enjoyment of classes and learning ought to be a high priority of every teacher. When I taught science to fifth graders, I found a good portion of the students coming in the fall with negative attitudes toward science, but science can be fun. Students get to do and learn, go and find out, experiment and try, and to think through. Science is a marvelous subject—almost as good as physical education. I made no bones about enjoyment being a first priority. It was important that those students would enter sixth grade looking forward to their science classes. And I'm not going to apologize for it. In fact, if every teacher would teach with that in mind, schools would not fail our children so badly and so often. Enjoyment of physical education is a first priority of all my teaching. But that does not mean we don't work. Nor does it mean fun over discipline. Work can be fun and should be rewarding and enjoyable.

Seeing Children as Individuals

I recognize that seeing children as individuals is a part of pedagogy, but it's too important to leave out of attitudes. All teachers must assume an attitude that they are not just teaching groups or skills. They are teaching individuals in a group setting and their primary responsibility is to help each individual progress in skill acquisition.

Appreciation of Young Children

I once had a shouting match with a principal because he wouldn't let me teach second grade. I had to ask if he wanted me to take leave of absence and do student teaching in that grade. I won the point and the assignment; but you know, he had been right, I was wrong. I was not suited at that time for second grade and the summer following I found out why. Jay Yanoff, in an extensive workshop on learning disabilities made the statement that hyperactive teachers made hyperactive students — and I saw it all.

I had been great for fifth grade and good for fourth. I would come in the morning with excitement and enthusiasm for the day's activities and the children responded beautifully. But second graders don't need that. They were off the walls. Primary children do not need enthusiasm from the teacher. They do need appreciation. They need someone to appreciate that they are there, to appreciate what they are doing, and to share their joy in accomplishments. They supply their own enthusiasm. Schools deny it, insisting that they conform, so that in several years it becomes necessary for teachers to supply the enthusiasm.

Research on enthusiasm in teachers points out that training teachers to be enthusiastic did not seem to make as much difference in the primary grades. Of course it doesn't. We need to think through the purposes and uses of enthusiasm and why we need it. Children don't naturally hate school or turn it off, nor are they naturally bored. We teach them that — surely and inexorably. They come to school needing appreciation. It would be interesting to study the differing effects of both appreciation and enthusiasm on all ages of children. Vera Johnston, NASPE's most recent Joy of Effort recipient, gives learning to feel and show love and empathy to young children a very high priority. This is the appreciation youngsters need.

Competition/Cooperation

We are very good at teaching children to compete. Teaching them to cooperate is the greater challenge and the more desirable. Many of our students would rather deprive others and themselves of rewards than allow others to receive any awards (Campbell, 1974). How can we expect these students to get a job and suddenly turn off their competitive natures in order to cooperate with others to get necessary jobs done? If you don't agree with this point of view, let's at least avoid overemphasis on competition. The subject deserves greater study and research.

Ability To Admit Mistakes

The attitude that we must be right permeates our schools. Neither teachers nor administrators are immune to this attitude, the only difference being that administrators know that teachers can be wrong and teachers know the same about administrators but both groups tend to hide this from students. Where are students going to learn appropriate behaviors to use when they goof, if all significant adults cover up every mistake? We have to be willing to say to a child or a class "For crying out loud, did I ever goof!" or "Look what I have done. What shall I do now to help the situation?" We get unhappy with students who cannot admit they goofed but how long has it been since a teacher publicly admitted a mistake or failure and displayed appropriate modeling behavior?

KNOWLEDGES AND UNDERSTANDINGS

Professional Isolation

The first reality of life in the public elementary school is that elementary special-area teachers are professionally isolated from specific professional contacts. Second grade teachers can converse with other second grade teachers and also with first and third grade teachers and they all have a pretty good idea of what is going on and what should be going on. Most elementary teachers and principals can carry on meaningful professional dialogue with each other. The elementary specialists are not so fortunate. They can discuss general educational issues and practices and children, but their growth in physical education is not so easily stimulated. Physical educators can go for days, months, even years without seeing another kindred soul.

The isolation is compounded by the absence of meaningful supervision. In some 20 years of public school teaching, I have worked with 20 different principals and only two of these were able to give me meaningful feedback about teaching physical education. Those two individuals know a great deal about teaching and feel secure enough to examine the teaching process in different settings. Happily, one of those is my present principal.

Most principals are content to leave you alone. This gives teachers enormous degrees of freedom in teaching and subject matter but this freedom leaves them without a major avenue for professional growth (Mancini, Wuest, Vantine, and Clark, 1984). Winget (personal communication, June 1984) has pointed out that because principals do not understand physical education, they tend to evaluate aspects they do understand. They evaluate promptness, lesson plan deadlines, control, neatness of equipment, bus, lunch and detention duties, and general professional demeanor. The recent trend toward eliminating subject area coordinators has eliminated another elementary supervisory avenue.

Suppose that you went to work every morning in the department of elementary education, that you worked with students all day long, that you never saw another physical educator on the job for the entire year, and that your immediate superior was a social studies specialist? I know some of you are thinking how nice that would be. But would it be so nice if you were young and eager to share thoughts and ideas? Would it be as nice the second year? Would you want to look toward an entire professional life spent in this way? Remember that during the day you can't even reach anyone by phone, because if you happen to squeeze out a few minutes, the receiving party will not have time to talk to you.

The isolation of the elementary specialist is real and is damaging to the professional growth of teachers. Prospective teachers must have knowledge of this before they go out, and should have already thought out several strategies to overcome such isolation.

The Hardest Job

Every teacher thinks her or his job is very difficult and no one wants to admit that someone else may have to work harder. I have taught in the gymnasium and the classroom, and kindergarten through college, and there is no doubt in my mind that conscientious teachers who work with young moving bodies are forced to give more of themselves than any other group with the possible exception of kindergarten and preschool teachers.

The elementary gymnasium contains constant movement. My eyes don't get tired but believe me, there is maximum sensory input. Did you know that children have a direct connection between their feet and their mouths, and that the faster they go, the louder they will be? This is a natural phenomenon that teacher and students must constantly work to overcome. Noise, creative exuberance, and unpredictable bodies and personalities combine to force the elementary physical educator to stay on constant alert. Perhaps a more appropriate simile would be that these teachers pass through alert, combat readiness, actual battle, and back to alert without any intervening rest and relaxation.

On top of this, teachers have their own agendas for accomplishment and their almost constant concern for interpersonal relationships and feelings. Another factor is that every thirty minutes a new group arrives with totally different bodies, movement patterns, relationships, attitudes, and personalities. Not only are the bodies and personalities moving, but they operate in a large space that often has one of two conditions; either the space is filled with as many pieces of equipment as there are children (each piece moving independently of every other) or the entire room contains equipment that any court in the land would classify as an extremely attractive nuisance. These factors combine to produce a total drain of a teacher's resources—by late morning of every day. But don't ask any other teacher to admit our job is harder. They won't do it.

The Greatest Opportunity

Physical education of the young presents the greatest opportunity available in our public schools for individual growth of young students. I believe that physical education is one of the two most important subject areas in elementary schools. The other is reading, and mathematics is not far behind.

The importance of physical education is in inverse proportion to age. The younger the child, the more important physical education is. When children come to kindergarten, many of them are completely devoid of any comparative sense. Their egocentricity and their lack of awareness of what others are doing means that they don't realize their skills are not as good as others. Most children entering first grade have a well-developed sense of comparison (for better or worse) and almost all of them have this before they leave first grade. They react to the stimuli of school and playground in a number of ways including identifying, attempting to fit in, enjoying, competing, and withdrawing.

It is important that we work with children with less developed skills before they do too much comparing and begin to withdraw. Because physical skills are more visible (there is no place to hide in a gymnasium) and because playground, gymnasium, and neighborhoods operate around a base of physical skills, learning these skills becomes of prime importance to most children.

When you find a physical education/playground dropout, you usually have a child who should have had more physical education in kindergarten and first grade. Many of the poor skills of kindergartners result from lack of exposure, opportunity, and experience. Daily physical education and extra periods for those who need them help kindergartners with poor skills narrow the gap between them and the highly skilled, at a time when it otherwise would become more pronounced.

The greatest potential should bring the greatest challenge and the greatest responsibility. However, because physical education is not allowed to fulfill its potential, it usually brings frustration instead.

Behavioral Objectives and Bankruptcy

For the following, I am indebted to Linda Fischer-Packales of Cleveland State (personal communication, June 1984). We were discussing "moving about" and she had just read Hawkins' article "Messing About in Science" (1965). She said that people who teach people find themselves personally bankrupt. But it's worse when they try to meet behavioral objectives and still try to be a humanist. It's all outgo with no return. When we have to teach people and also teach so many specific skills, it is all going out; there is nothing coming back. When we can't mess about with our teaching, there's no time for interpersonal reactions and relationships that give us some returns and help to restore our balance. Acute bankruptcy occurs when a teacher tries to teach other systems. It can be restored with messing about in teaching and with the relaxing of the agenda. If we can't mess about, if we're always in a square or a cube of someone else's design, what do we get back? There is nothing that satisfies the soul.

Accountability

Accountability is for ourselves, not the children. One of the most far-reaching shams perpetrated on the public schools is that teachers should be accountable for children's progress. This concept, borrowed from industry that deals with physical things moving through mechanical steps until they result in specific predictable products, is not and should not be applicable to children or to education. Until recently I could not understand how educators could be led down this path. But superintendents must anticipate public reaction and have allowed accountability in the schools in order to satisfy the public. Teachers have had it imposed on them but it is time to rear our professional heads and say "Whoa!"

No other segment of society is asked to be accountable for the behavior and progress of a group of people about whom they have no choice in the selection and no chance for rejection and for whom they have little to say about the curriculum. Doctors and lawyers see their clients one at a time, and after the initial visit they either agree to work with them or refer them to someone else. They don't take groups of clients, some of whom feel like prisoners. When I am permitted to pre-interview my clients, to accept or reject, to schedule them in groups of three or five or 25 as I wish, to say what will be taught and what will be accomplished, to move and remove clients who do not work well in their groups, then I will be willing to be accountable for their progress, not before.

Accountability can be and should be assumed by individual professionals. I *am* willing to be accountable for myself as a professional with all that implies. I will be accountable for a professional job of preparing for my teaching, for the professional conduct of my classes, a professional manner, and for exercising my best professional judgment. For these I have been well educated. To ask more of me is to relegate me to the factory of education and to deny my professionalism. I'm not willing to give it up!

Political Realities

The political realities of education as an occupation require some sophistication to recognize, more to understand, and a tremendous amount to utilize. The first political reality is to recognize who is in charge. In most communities today, it is the public. We have three groups of clients: those who receive our services (our students), the parents of our students, and other taxpayers. We tend to think of our clients as students and forget the two groups that pay the bills. We don't dare ignore any group.

In more communities every year, the taxpayers without children exceed those with children in school. If nothing else, this has great implications for outreach and public relations. The large, elder group is being invited into our schools, not only because parents no longer have time to give and retirees do, but because there is no better way to inform the volunteers about the schools' programs. Many schools are not afraid to let the public see what is going on. We believe in the process of public education as we carry it out, and we want an informed group of voters.

The second political reality is that schools operate as a bureaucracy rather than as a professional institution. Brubaker and Nelson (1974) have made this distinction rather nicely:

Professional Model
Make decision
Implement decision
Deal with public reaction

Bureaucratic Model
Anticipate public reaction
Make decision
Implement decision

We might add a fourth step to the bureaucratic model—that of adjusting or responding further to public reaction.

Public schools must be responsive to the public. In most states, they must be responsive to those who pay the bills and make the decisions regarding the availability of funds. While the bureaucratic model might be appropriate for the management of public schools, it frequently is not appropriate for curriculum development and instructional decision making.

The third political reality has to do with the power of a superintendent. Once a board hires a superintendent, they have a vested interest in his or her doing well or appearing to do well. Technically, the board is over the superintendent but an astute superintendent will immediately turn that around and control the board. The board will place enormous trust in their choice and will do everything possible to help the superintendent succeed. Superintendents who cannot control boards tend to move on quickly.

Another view of this relationship would be that the superintendent only has to keep five people happy on Ohio school boards—satisfied that he or she is doing as well as possible under the circumstances. This should be easier than with a large corporation. The chief executive officer of a corporation has to satisfy people who are more knowledgeable and sharp about the business than lay public are about running schools. And, of course, the board members of a corporation have much more to protect than their reputations—their financial futures are frequently tied into the corporation. We must recognize that in some communities the board does control the superintendent but I suspect that in many cases that superintendent just doesn't know how to play the game—yet.

The power of the superintendent is passed along to the principal. Within the building, the principal might as well be queen or king. Teachers need to understand the dynamics of our still largely paternalistic elementary schools. The amount of power available to or assumed by the principal is in inverse proportion to the age of the students. Secondary school principals have less power to change things by themselves for one very simple reason. High school teachers won't take too much from principals—or anyone else for that matter. However, elementary teachers will, and because they will they get dumped upon.

This brings us to the fourth political reality, that is, the lack of assertiveness of elementary teachers. When I first went into the elementary school, I had had two years of high school experience, seven years of university teaching, plus two years of graduate school. This was back in the days when most men's and women's departments were separate. Most of my contact (thank goodness not all) had been with women. Now, there is nothing shy about college women physical educators. They had chosen an occupation, they had fought their way through graduate school, and most had been on sports teams when it was not as socially acceptable as today. These women were assertive before that term came into common use, and some of them were downright aggressive.

At the other end of the assertiveness scale, we find elementary teachers. They tend to be very dedicated to their children and to their work. However, they also tend to adjust to the conditions they find themselves in and not make waves, or even ripples, and they tend to do as they are told. If they are asked instead of told they will do practically anything. Discussing this with colleagues, I have been told that preschool teachers are even less assertive!

When you combine the mental attitude of many elementary teachers with the structure of public schools, it is not a pretty picture. It is compounded by the small size of many elementary buildings which permits close supervision of a small group of teachers by one principal. Is it any wonder that paternalism thrives in our public elementary schools? Paternalism then, becomes the fifth political reality that needs to be addressed.

The sixth political reality is to me the saddest. Elementary teachers are valued more for their bodies than for their minds. I learned very early in my elementary experience that the fact that I was a warm body controlling—hopefully teaching, but definitely controlling—a group of children for the specified time, was far more important than what I did with those children. We can be scheduled the same as facilities. We don't need breaks and why should we care in what order the classes are scheduled? Facilities don't care about those things. We are properties, round boxes that must be fit as well as possible into the rectangular holes of classroom doors. We are told this in so many wordless ways that even those of us who suppress it can't help but be affected by it. All too often this is the case. Teachers and facilities do not have to be treated much differently—although matching them together with a little care in the beginning saves many headaches for the principal.

It Doesn't Matter, But It Does Matter

The first time I left the university scene for the elementary school, I was unprepared for a number of things, one of which was that the quality of the job I did did not matter. As long as I did a passable job, it made little difference to others how well I did. When teachers are commended, all of the teachers are commended. When teachers are "appreciated" (e.g., with an appreciation luncheon, dinner, or program) all of the teachers are appreciated (Kaiser, 1981). The neophyte and the veteran, the poor and the outstanding, the loving and hateful are all treated the same. It doesn't matter. That's the point—it doesn't matter. It doesn't matter that you spilled your guts and the teacher next door hardly lifted a finger. It doesn't matter that you slid along with as little effort as possible while the teacher down the hall gave 150 percent. It simply doesn't matter because we are boxes, bodies to fill spaces.

The second time I moved from the university to the elementary school, I was far better prepared for this reality. I was not prepared for the fact that it did matter. All my good work and extra effort mattered a great deal—to fellow teachers. I was reprimanded more than once for doing too much. "The other teachers don't like it." "It makes them look bad." "Yes, we love the activities you're doing with the children but could you please ease up?"

I must say that this is far more apt to happen to classroom teachers or to secondary physical educators than to a lone specialist. Single specialists don't have to worry as much about the comparison factor; they are expected to have extra activities, but doing too much can be damaging to professional relationships.

The past fall was my third move from university to elementary, and so far I have had no surprises.

The Unknown Wilderness

The public elementary schools are an unknown wilderness. Nothing that is written describes conditions as they exist. The climate is shadowy, nebulous, inarticulated. It is hidden, lurking, sometimes dormant. It is seldom discussed because educators tend to pretend that they have it all together. To admit that they don't is to open themselves to unknowns that may be worse.

Some teachers face it—some don't recognize it exists. A few puzzle it out for themselves. A lot give up on that aspect, mistake or mislabel it, or miss it entirely. The problem is that the unknown wilderness does influence us: it works on all the teachers. No one knows how much it wears us down.

There is so much of a human aspect that cannot be measured or described. There is a meeting of so many personalities, and the climate changes from moment to moment. Personalities expressing themselves is probably in inverse proportion to the need for enthusiastic teaching. The human aspect is always there and can pop up positively and negatively.

The influence of parents is felt tremendously in the elementary schools. Part of our job description should be breaking in parents. Countless hours are spent explaining, encouraging, discouraging, and learning to live with parents. We have to operate with their perceptions of their children, our programs and abilities, and education in general.

The unknown wilderness has to do with dreams and rose-colored glasses. It has to do with expectations of good and failure to protect ourselves, to shield, to realize the truth. It also has to do with tales of intimidation and fear of transfer; involuntary transfer being the threat held over every elementary teacher's head. It has to do with unpopular assignments and abrupt changes, perhaps in the middle of the school year, things which happen to teachers who are out of favor with the powers that be.

Because of the structure of the public elementary schools and because of human nature, teachers are often treated more like students—mature, responsible, big, sixth graders, but still like students. Since teachers are inherently good students, they allow this to occur.

The elementary schools need a redirection with emphasis on what Dwyer (1980) refers to as a "liberation of the human potential of those who will work at liberating the human potential of others." This we do not have today.

I have painted a fairly bleak picture of life in our public elementary schools. I do not wish to leave you with the impression that all our schools typify all these conditions; they do not, but many do. Most will have one or more of these conditions. I happen to be very fortunate in my school district and I like what I'm doing. There's a lot right with our public elementary schools, but prospective teachers don't need inoculations against the good they will encounter.

The point I would like to make is that we cannot prepare elementary physical educators only for ideal positions. No matter how lively a school system new teachers find themselves in, some of these foxes will be around to spoil their grapes. Are you going to prepare the prospective teacher for this or still leave it to chance?

The Rest of My Task

I am getting back to the four charges given to the speakers with global comments. I have four suggestions to make to better prepare physical educators for life in elementary schools. The first is to find ways to refute or verify some of the assertions made today. We must have more sophisticated techniques for getting at things people don't want to talk about or haven't brought to their consciousness. It is obvious to me that research is needed in new directions.

The second suggestion has to do with more research on the needs of teachers and the sources of satisfaction on the job. Kaiser (1981; 1982) has explained teacher need using Maslow's need hierarchy and has explained job inducements by using Herzeberg's motivator-hygiene theory (see Figure 1). That the basic needs of teachers are not being met seems evident. We need to dig more deeply into the factors in public elementary education that prevent teachers from self-actualization and that keep them from the true motivators of recognition, achievement, responsibility, and advancement.

MOTIVATORS

Maslow	**Herzeberg**
Self-actualization	Responsibility and advancement
Ego	Recognition and achievement
Belongingness, social love	Conditions and relations
Safety and security	Fringes (retirement, medical)
Physiological	Salary

Hygeine

Source: Kaiser, J. (1981). Motivation deprivation: no reason to stay. *Journal of Teacher Education. 32 (5). 41-43.*

Figure 1. Personal and Job-Related Factors of Motivation

The third suggestion has to do with adding material (we're never asked to delete—just to add) onpolitics and survival in public elementary schools to teacher preparation programs. Human kind is supposed to be superior because we can build on the past. If these are the conditions found in our schools and if we refuse to address them or refuse to prepare our graduates to deal with them, then we must be prepared for more teacher dropouts, quicker teacher burnout, and greater numbers of zombies in our classrooms who don't know what hit them and don't know what they're fighting.

My fourth suggestion is being implemented in many institutions. It is that education majors must be given more actual contacts with students of every age. I believe that this should occur in conjunction with studying the growth and development of the children of a specific age. Studying those children, observing those children, and working with those children should occur simultaneously with the study of appropriate curricular materials for that age. Instead of having separate courses for each of these areas, we ought to be studying everything about one small age group during one term. I believe that most professional students need far more hands-on experience with young children.

The fifth suggestion is not new. Those involved with professional preparation of elementary teachers must get into the elementary schools, should be given two-year leaves to do it, and should have a constant, continuous relationship with a particular school and a particular group of children. I applaud those of you who keep working toward this end.

My sixth suggestion is not as difficult to implement because it does not require faculty review. It is, simply, an individual educational plan (IEP) for every advanced professional student. We talk a lot about individualization and providing IEPs is one more way to show our students that we do believe in individualization. It would not be so difficult to do a continuous computerized IEP for each advanced major. They need to know where they are, where they are going, and how they might get there. Getting such students in the habit of working with their own IEP could help them relieve some of the professional isolation. They could include plans for working with a buddy, for periodic refreshers, and for calculated self study. IEPs could be a lot of work but if put on a computer, students could do most of the work. Hard copy could be kept periodically and students could take a disk of their program with them upon graduation. I can't think of any better way of saying to a graduate, "We expect you to continue to grow."

Thank you for your attention. I appreciate the opportunity to focus my thinking, even though it has taken many weeks from my personal life. It has been good for me and I am well aware that even a turtle has to stick its neck out if it wants to get anyplace. Go for it!

References

Brubaker, D.L. and Nelson, R.H. (1974). *Creative survival in educational bureaucracies.* Berkeley, CA: McCutchan Publishing.

Campbell, D.M. (1974). On being number one. Competition in education. *Phi Delta Kappan*, 56(2), 143-145.

Dwyer, T. (1980). Heuristic strategies for using computers to enrich education. In R. Taylor, *The computer in the school: Tutor, tool, tutee.* New York: Teachers College Press.

Hawkins, D. (1965). Messing about in science. *Science and Children*, 2(5), 5-9.

Kaiser, J.S. (1981). Motivation deprivation: No reason to stay. *Journal of Teacher Education*, 32(5), 41-43.

Kaiser, J.S. (1982). Teacher longevity: Motivation or burnout. *Clearing House*, 56, 17-19.

Mancini, V.H., Wuest, D.A., Vantine, K.W., & Clark, E.K. (1984). The use of instruction and supervision in interaction analysis on burned out teachers: Its effects on teaching behaviors, level of burnout, and academic learning time. *Journal of Teaching in Physical Education*, 3(2), 29-46.

From the Ozarks to Orlando: Now That We Understand the Question, What's the Answer?

Lawrence F. Locke

This is the closing session, and the program indicates that now we are supposed to have a "conference summary." I say "supposed to" advisedly, because although such a closing act was possible when we met at the Lake of the Ozarks a dozen years ago, it is no longer. Happily, however, it is all your fault!

In 1972, it was possible to summarize what had been said about preparing elementary specialists in physical education because had it not been for one major address by Lorena Porter, there wouldn't have been anything to summarize. The small special-interest sessions dealing with teacher preparation had been poorly attended and, as concurrent program items, they had not been available to all the conferees. Consequently, almost all of the talk in the main arenas of the conference had not been about teacher education, but about school curriculum and how to teach children.

Because Dr. Porter was her usual self—terse, explicit, clear, and completely organized—I was able to summarize her singular contribution in a few sentences. Then, to borrow the useful words of Marion Sanborn, I was free to "mess about" for thirty minutes and quit early. Because it was late and everyone was ready to leave, my closing address was regarded as a considerable success. Few were inclined to notice that much of the content in that summary had only the most tenuous connection with events over the previous three days.

The fact that 30 minutes of messing about with teacher education could be regarded in 1972 as cogent synthesis, tells where we were then. The fact that neither I nor any of you could get away with that in 1984 tells where we are now. Above everything else, this closing session should celebrate that wonderful fact.

As for the business of conference summarizing (a pretentious idea anyway), you have talked so much, in such detail, over such a range of topics and stuck to the topic with such persistence, that volume and diversity alone make summary a task for weeks of reviewing notes and papers. At the least, it is a job for a team rather than an individual. Perhaps the conference planning committee, which was the root cause for this embarrassment of riches, should be stuck with the job.

For Orlando, the planning committee knew not only the difference between school curriculum and teacher education but also the relevance of one for the other. They certainly knew the difference between program content and program process in teacher education. They selected speakers who unerringly knew the difference between inservice and preservice clients and who clearly understood the difference between the subject matter of movement and the scientific art of pedagogy as two distinct forms of program content. We even had speakers who could explain the subtle difference between intended and unintended curriculum in teacher education. Happiest of all, however, everyone seemed to appreciate the critical distinction between rhetoric about programs and the hard realities of teaching teachers.

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In response to this single-minded focus by planning committee and speakers, fully three-fourths of the questions and comments from the floor dealt with *teacher education*. Nearly everyone seemed willing to set aside the topics of what best to teach and how best to teach as questions which could *inform* but not *constitute* a conference on preparing the elementary specialist. In doing so, we, the conferees, have created the *first* National Conference on Preparing the Physical Education Specialist for Children. I ask you to join me now in a moment of loud tribute to all of us!

Out of fairness to the organizers of the 1972 conference, what happened then may have been necessary, perhaps unavoidable. We had to go there and fail in order to understand what success would have to be. In that sense, all of us owe a debt of gratitude to AAHPERD, the individual members of the Elementary School Commission, and the Task Force on Children's Dance. They were the pioneers who knew we had to begin, even if there was no clear map to guide the journey.

If we learned only what teacher education is not, Lake of the Ozarks may be one reason why the preparation of elementary specialists now has a clear head start and a growing lead over the enterprises of preparing either K-12 generalists or secondary level specialists. Elementary is where curricular reform and technological sophistication have found the widest application. Preparing elementary specialists is where the action is in physical education, where the optimism is, and, increasingly, where the hope remains.

To appreciate what you have accomplished, it is important to understand that good intentions and hard work do not a successful conference make. Only a year after Lake of the Ozarks, AAHPERD planned a professional preparation conference in New Orleans which attempted to utilize an "all level/all subject" approach to the topic. To say that the results were undistinguished would be kind. The enormous frustration consequent to the painful confusion of New Orleans was a central factor in our inability to recruit any serious interest in teacher education at the national level of AAHPERD for nearly a decade.

Conferences do not always work; sometimes they move us back rather than ahead. Most often conferences move us back when the people who plan them are unsophisticated about the topic area or are under serious political constraints created by other people who don't understand the territory. In other cases, the planners may have a fair grasp of what the proper questions are, but fail to discipline speakers and conferees to address a single agenda. Witness the 1980 Chicago conference on professional preparation which had a format at least as creative as we have in Orlando, but which ended up diluted and unfocused because nobody had succeeded in defining what was to be talked about when professional preparation was the topic.

We did not often have that problem at this conference. Planning committee and conferees knew what to talk about. The only significant difficulty arose around the complex problem of how content in school curriculum relates to content in teacher education. No one should be surprised or overly concerned that we stumbled a bit over that tangled knot of relationships. That confusion can be sorted out in the continuing dialogue which inevitably will follow this conference. Given our overall performance, we earned an "A" for staying on task.

While passing out bouquets please pause to note Judy Rink's concise and generally accurate summaries of each major paper. I am aware, as is she, that there is divided opinion about whether such periodic summing up is a useful or even appropriate strategy for a conference. What has not been heard is any suggestion that she failed to do it skillfully and with singular grace. I, for one, appreciate her careful efforts and used them freely in performing my own task.

Once in the congratulation mode, perhaps we should go all the way and have an orgy of appreciation for all the good things that have happened in the last decade for people who care about physical education for children. Much of it *is* related to professional preparation and thereby to the people in this room. Think for a moment and be happy about the following:

1. We now have specialized training routes at more institutions than ever before in history. A recruit to teaching children does not have to take preparation in a program based on K-12 certification, does not have to be taught by a faculty with only one elementary specialist in residence, and does not have to elect to study where a single elementary methods course is the sole instrument on which to base a career. There are substantial, well-designed undergraduate programs for anyone who is willing to seek them out.

2. Research on teaching has begun to influence the content of professional preparation programs for elementary physical education specialists. In some programs, undergraduates in a movement skills course are as likely to be coaches in techniques of efficient class management, strategies to increase time on task, and the mysteries of "withitness" and overlapping as their peers who will teach reading in the classroom.

3. Some undergraduate programs now do a good job of sensitizing graduates to issues of race, sex, and

motor equity. Although the general level of preparation in this area for all graduates is far from satisfactory, we now have good models, some field tested materials, and a slowly growing base of relevant knowledge. If commitment to this vital task can be diffused through all programs, we will have taken another giant step for all children.

4. We now have attractive, nationally disseminated elementary curriculum models that are not explicitly sport or sport-skill based. Rooted in generic skills for playful and expressive movement, these resource products have exerted a positive influence on school programs in many communities.

5. There is more pedagogical diversity seen in elementary physical education. Variations on task or task/practice styles now are as common as the simple command format. If you are inclined to wish for even more variety—then go and make it so!

6. Methods and materials designed to help elementary teachers accommodate children with special needs in the motor play environment have become sophisticated, highly utilitarian, and widely available.

7. We have produced elementary curriculum and methods textbooks that are better, by far, than anything else in physical education, and easily are a cut above most comparable texts for classroom teachers.

8. The domain of motor development literature for children is thicker and more useful than ever before—partly because professional programs demand such information. Publishers, journal editors, and scholars do respond to clear opportunities for producing and disseminating knowledge that informs and shapes professional practice.

9. Use of systematic observation instruments for teacher feedback and other purposes is as close to commonplace in elementary physical education classes as in any other area of education—including secondary school, college, or even athletics.

10. Many of the best and brightest graduate students in curriculum and instruction, staff development, and pedagogical research took their initial training in elementary specialist programs. The quality of their dissertations and subsequent scholarship is something of which we can be proud, as is the fact that they so quickly are becoming agents for change in both school programs and teacher education.

That is a long and encouraging list, but perhaps we have had enough of self-congratulations. For me, the conference will not feel complete unless I have at least one opportunity to play the role of resident "old curmudgeon." Donning that hat gives me license to enter public complaint for both myself and all of you who have taken the opportunity to pass on private concerns. As you might expect, several defects in the program have left some feeling unfulfilled—and me outright grumpy.

Have you noticed that in the three-day conference on preservice and inservice teacher education—a meeting involving some of the most thoughtful professionals, active scholars, and creative practitioners in the business—we did not have a single speaker, session, or activity through which any of us could learn about, review, or discuss what *research on teacher education* has to say concerning how good teacher education programs should be designed, operated, and evaluated?

I thought that learning more about how to use knowledge to do our work better was supposed to be one of the main reasons for coming to Orlando! It is almost as though we didn't want to be bothered with the facts. We were comfortable with generalizations and satisfied by exhortation, but distinctly uneasy with the nuts and bolts.

Did you notice that we did not have a single speaker, session, or activity through which any of us could learn more about how research-based knowledge can be used to improve the art of helping teachers? In fact, the topic was not even mentioned in any of the main conference sessions. It is as though there was nothing to know about the technology of *research utilization in teacher education*—no literature, no dissemination projects, no research and development centers, no model programs, and nothing to learn about how research can be put to work in teacher education.

Finally, and most amazing, given our obvious interest in the content of training programs—we did not have a main speaker, session, or activity through which all of us could learn what *research on teaching says (and does not say) concerning the content of preparation for effective instruction at the elementary level.*

I noticed those three curious omissions: research on teaching, research on teacher education, and development designs for utilizing research in teacher education programs. That it bothered me was to be expected—disapproving is a curmudgeon's primary function—but the real question is whether or not *you* should be bothered. Did you lose out on anything really valuable? Were all of us cheated by those three omissions? Let me present the case for the prosecution.

In his dissection of the liberal arts versus professional training issue, Daryl Siedentop made a passionate appeal for the need to help teachers learn critical skills required to do their work. In both his address and the question period which followed, it was clear that Daryl had identified a set of basic pedagogical skills by recourse to the research on effective teaching. Were you not curious about what those skills might be, how well they were supported by the literature, and how they could be made part of a preservice or inservice training program? The speaker did not give you the answer to those questions; that was not his job. At this conference, *nobody* was assigned the task of talking about research on teaching as a source of program content, or the tricky business of research utilization in program design.

Yesterday, Patt Dodds talked about research on field experiences by using three examples from the research literature. Audience reaction to her address indicated that she succeeded in raising questions that might change how some of us think about program component. Did any of you wonder what she might have said about lectures, discussions, textbooks, films, simulation devices, demonstrations, observation, practice, feedback, microteaching, peer teaching, coaching, transfer, retention, or any other program-related topic on which there is substantial research literature? She did not address any of those vital topics because it was not her job to do so. At this conference, *nobody* was assigned the task of talking about research on teacher education.

For the sake of accuracy, it is true that in the concurrent, special interest sessions there was a lively presentation and discussion involving ALT-PE, one each of short sessions on data-based survey and program evaluation research, and presentation of several program models which have strong links to the knowledge base. The difficulty is not with the quality or relevance of those small evening meetings. The problem is that there was no provision in the large, prime-time sessions for a moment when all conferees could gather and be brought up to date on research on teaching, research on teacher education, and the literature on research application procedures in teacher education. I believe that constitutes a serious omission in the program.

If you agree, all we can do now is be sure the next program planning committee does not make the same mistake. To ensure that protection, we need a diagnosis of what went wrong this time. Which of the following causes seems most likely to you? Did the planning committee consider space in the program for research, but decide (1) there wasn't enough of the stuff to bother, (2) they didn't trust it to tell the truth, (3) it really wasn't relevant to preparing elementary specialists in physical education, (4) it was all too contradictory to be of any practical use, (5) it would be too boring to have to sit and hear about it, (6) the conferees would never understand it, (7) everybody already knows what it has to say, (8) all of the relevant research involves ALT-PE and that stuff belongs in an evening special interest session, or (9) each speaker will use research-based knowledge as appropriate and thereby no separate program component need be planned. As an alternative, can you imagine that the members of the committee never thought about research at all?

My own diagnosis is the ubiquitous "all of the above." Put in the same position, most of us would have shared at least some of the same concerns which apparently influenced the planning committee. Nevertheless, whatever sympathy we may have for those who wrestled with the burdens of program planning, there is no valid excuse for not making research-based knowledge a central part of any conference which purports to deal with teaching and teachers.

Some of the items on our diagnostic list of reasons for ignoring research simply are false and others represent real problems that demand response in the form of creative program planning. There is relevant research, and not all of it is contradictory. Trust is a problem, and not only for those outside academe; but it is a problem that can be addressed. Boring speakers will give boring talks on any topic—not just on research.

Finally, there are few people here who already know all that research would suggest about preparing teachers, and, with skill and sensitive assistance, every person here could be helped to understand better the research that is available. At least it seems reasonable to think that such an important conference topic can be better provided for than leaving it to accidents of judgment by individual speakers who have other primary assignments.

Please understand that my appeal for specific attention to research at the next conference does not presume that research will tell us what to do. Educational research will not tell us how to prepare elementary specialists; that is not its purpose. The expectation that it can perform such magic is one of the most mischievous, dysfunctional, and even dangerous notions ever let loose among us. Research only helps you get smarter about the territory in which you have to make decisions.

Deciding on a course of action and carrying it out is a different process entirely from understanding how things work. To design a teacher education program that can make use of research requires a mixture of considerations:

1. moral norms based on personal values about what is right,
2. craft norms based on accumulated practical wisdom about what works,
3. aesthetic norms based on our judgment about which actions appeal most to our sense of order and style,
4. practical limitations and political constraints within the local situation, and
5. technical norms based on scientific evidence and understanding about how things work.

Being smart about the territory certainly can help, but by itself it does not produce correct action. There is no science of teacher education and there will be none. Preparing teachers is a practical art, although there is a scientific basis for practicing that art. If we fail to make effective use of that resource, our programs, our students, and their pupils will be the poorer.

If you are persuaded on this point, at the appropriate time we can remind the program planning committee for the next conference. We can write to AAHPERD to confirm our support for both another conference and more complete program coverage. We can even volunteer to serve when the long and thankless tasks of conference organization must be performed. Ultimately, we all will have the power of a vote in our registration money. That, however, is the least desirable recourse and one which should not be needed if the lessons of Orlando are remembered.

Enough complaining. On balance, it was a fine conference and we all go home better for having participated. It may help achieve a proper sense of closure if you will engage in one final task. I will provide a short list of important topics raised over the past three days. There is no guarantee that your list would be exactly the same or that this list will represent any sort of valid consensus. It should provide a reasonable tool, however, for building a finish to this conference.

As I go through the list, your task is to note a response to each item. You can choose one of three ways to respond—grade, plan, or prioritize. If you want to grade, you can give this conference a report card by assigning an "A" if the topic received serious and (for you) useful attention, a "C" if it was at least clearly named and noted, and an "F" if the topic was ignored. If you want to plan the program for the next conference you can award an "X" for any items that should be given major attention with speakers, discussion, and perhaps an action workshop; a "Y" for items worthy of a special interest session; and a "Z" for things better left to another forum. Finally, if you only want to prioritize, simply think in terms of what topics seem most and least important for making progress before we gather again. Give "1" to areas for which you feel the greatest urgency, and award "12" at the other end of the scale.

I will provide one or several key words for each topic you can jot down for your own working record, and then I'll provide a couple of sentences to clarify the nature of the topic. Most of the topics on the list really contain nests of related problems, issues, and questions. I will call them *chunks* to suggest the cautions appropriate whenever we pull something out of the whole forming its natural context. The categories, which are untidy and temporary, are merely for our convenience—not a taxonomy of topics in teacher education. Note in particular that the first four chunks are entangled such that any discussion of one often is a discussion of the other three.

Chunk I: The Schools

The relationships of teacher education, preservice, or inservice, to teachers, programs, principals, children, parents, and school systems must be changed. If preservice graduates take jobs in schools that are inhospitable to good teaching, what is the point of improving teacher education? The notion that we can make those schools more hospitable by building some imagined strength into individual teachers is silly. Schools consume good, young graduates for lunch, and snack on experienced teachers between courses. Long-term, systematic improvements come only from many people working together. We know too much now to ignore the problem any longer. Teacher educators must become substantially involved with all the people who work in schools to create environments that encourage teachers to do their jobs well. How best to become involved is a complex social, political, and logistical question which demands our attention.

Chunk II: Preservice Program Design

Teachers can't transfer skills to the workplace that they have not acquired. Weak programs do not make reliable modifications in what their undergraduate clients know, believe, or can do when they actually have to teach. Lecture, discussion, a textbook reading, and perhaps a bit of peer teaching practice simply do not make any reliable difference in what graduates are likely to do in the gym two years later. At heart, this is a problem of training technology (program process) that helps novices acquire new skills and transfer supports that help them sustain what they have learned until they practice it in the field and move it into their permanent instructional repertoire. The training technology already exists and is not prohibitively costly to put in place. Descriptions of successful models for field support during preservice practica and the induction year now abound in the literature. What are left are the staff and organizational development problems of redesigning preservice teacher education programs to include methods that actually change what teachers do with children.

Chunk III: Inservice Program Design

Whether the motive is building more hospitable environments for graduates, providing training sites congruent with program needs and values, or simply fulfilling the charge of providing outreach services for public schools, teacher education faculties are going to become increasingly involved in inservice teacher development. To do that well, to make a real difference for clients, and in order not to end up with frustration, waste, and egg on their faces, both new skills and considerable sophistication are required. Experienced teachers are not undergraduates, schools are not college departments, and change is a different and chancy game out in the field. We need to listen, learn fast, and support each other in every possible way.

Chunk IV: Induction

Teacher education should be a lifelong process. Virtually everyone who has studied the continuum of development from presocialization of recruits to retirement of veterans has concluded that the key juncture is neither preservice nor inservice training—it is the first two years of employment, the induction years. If physical educators do not come to grips with that fact, learn about how induction shapes teacher behavior, plan how to best prepare graduates for the rigors and dangers of induction, and decide how to share a part in the action, then they will remain on the outside—mostly just looking in.

Chunk V: Preservice Program Content

We now know something about what makes effective teaching in physical education. We also can make fruitful guesses where the evidence is yet incomplete and, with cautious transformation of research on other kinds of teaching, we can find more clues to specific behaviors that make up good teaching. This pedagogical content must become the minimum expectation for *demonstrated* mastery by every graduate. The scope is large enough for programs to have their own stylistic emphases, but whether the element is skills for monitoring dispersed students, powerful forms of feedback, or strategies for maintaining equal access to learning for all students, there should be a common core of minimum expectations for professional skill. These should be acquired before a student is considered able to take full, unsupervised responsibility for a class of children. We need to define that minimum core and begin work on procedures for helping teacher educators incorporate it into their programs.

Chunk VI: Recruitment, Selection, and Retention

More than half of the variance in teaching behavior seen in any class of graduates will have been determined by the characteristics the class brought as entering freshmen. Less than half of their capacity for professional performance will be a direct result of the training program. If that axiom is true—and there are good reasons to believe that it is—then who comes and who stays to graduate matters a great deal in producing good teachers. This is not a matter of selecting for intellectual factors or high academic performance—a popular political matter which has little demonstrable relevance to subsequent teaching effectiveness. There are factors that can be detected in trainees that do have verifiable consequences in areas such as program completion, career commitment, vocational persistence, and job satisfaction. Attracting students with good prospects, counseling students out who have poor prospects, and retaining students with the best prospects are old but nevertheless vital tasks to which we have to give much more attention.

Chunk VII: The Disciplines

Most programs have achieved at least an uneasy truce between the residents of the academic disciplines in physical education and those who conduct professional preparation. Unfortunately, the end of internecine war has not brought with it much creative resolution of the central problem—how to help students make effective use of disciplinary-based knowledge in the work of professional practice. We have learned what does not work. Exhorting students (and teachers) to discover appropriate applications on their own does not work. Asking teacher educators to translate abstract knowledge into application resources does not work. Demanding that scholars in the disciplines teach in ways which reveal rich arrays of application strategies has proven ineffective (and probably was unreasonable anyway). What we need is some new thinking, some experimenting with better alternatives, and some sharing of successful models.

Chunk VIII: The Purpose of Elementary Physical Education

If teaching is a means, toward what ends is it aimed? As George Graham has indicated, our profession seems resigned (with varying degrees of comfort) to the necessity of agreeing to disagree on the question of purposes. Individual teachers, professional organizations, government agencies, communities, and even schools or training programs will continue to have different visions of the objectives for elementary physical education. As long as a purpose is clear enough for full public scrutiny and as long as it can be linked to effective means, there is no direct harm in marching to a different drummer. One exception to this rule is the preparation program in which consistency is a matter of enormous consequence. Show me a program where novices are constantly "jerked about" regarding what they should try to accomplish when teaching and I will show you a program that produces poor results. We need to work out program and staff development procedures that permit a faculty to identify a safe, minimum level of consensus on the objectives of elementary physical education. Models of both process and product might help many of us to resolve this familiar but still mischievous problem.

Chunk IX: Teacher Educators and Their Environment

Recruiting, training, rewarding, and developing teacher educators are processes we usually talk about (or gripe about) privately. It remains a fact, however, that if we ever want to do what we really could do about preparing elementary specialists, we will have to upgrade ourselves as a professional group and alter the environment that shapes and limits our behavior. When 50 percent (a conservative estimate) of all teacher educators have never taught a lesson in a public school, we have a problem. When full-time engagement in inservice education provides few institutional rewards and presents severe risks for tenure and advancement, we have a problem. If we don't make plans to improve our own work environment there will be little hope of attracting and retaining the cadre of talented people that teacher education demands.

Chunk X: Program Evaluation

We must return to George Graham's clarion call for program validation and make clear distinction among three kinds of evaluation.

1. If we study children and discover that when Duck, Duck, Goose is included in this physical education curriculum they become more fit, or cooperative, or agile, or whatever, then we have validated a content element in the program—and learned something about what should be included in the content of teacher training.

2. If we study the teaching of Duck, Duck, Goose and discover that children learn it quicker and more thoroughly when we use guided discovery rather than command-based progressive part, we have validated a pedagogical strategy and, again, learned something about appropriate content for teacher training.

3. If we discover that undergraduate teacher trainees can learn how to be effective in teaching Duck, Duck, Goose more efficiently and reliably when the program includes simulation practice and discrimination training, we have validated a process element in the teacher education program.

Everyone accepts that we need some of all three forms of program evaluation, but it must also be understood that the primary focus for a conference on professional preparation should be on number 3, evaluating teacher training.

Chunk XI: Participating in Public Policy

Preparing elementary specialists does not take place in a vacuum. We all are part of larger teacher training units, some of which are being buffeted by a storm of public criticism and punitive action by state legislatures. In other states, schools and departments are in the eye of a hurricane where the really radical response is "this too shall pass." Perhaps the greatest danger is that we will somehow survive the present crisis without having to make substantial changes to improve our position within higher education and the network of certification and accreditation regulations which surround our programs. The historic pattern of escalating attacks on teacher education suggests that the next return of this cyclic storm may bring the end of collegiate preparation for teachers. The people in Reston have been right about this all along. Every faculty that engages in preparing and developing teachers must learn how to exert sophisticated political influence and how to engage in aggressive preplanning about public policy rather than responding after others have taken action. Learning how to live creatively with the inevitable and how to influence what appears to be possible in the realm of public policy is a competence few of us thought would be required when we entered our careers. For better or worse, the game has changed and in many states we either will learn to play at politics or live with the unhappy consequences of being only spectators.

Chunk XII: The Research Agenda

We have limited resources for research on preparing elementary specialists. A sense of the priorities among possible questions is absolutely necessary. We need to know where data and understanding will have the largest payoff. Professional organizations, each training program, and each teacher educator needs a "to do" list that will remind them of where the big questions are located—particularly when temptations to dabble with time and resources are present. I've suggested my own agenda—you will need yours. Perhaps together we should prepare a master list for the elementary specialist area of the profession.

How do we learn about and systematically alter the subjective warrants (ideas about teaching) which, Hal Lawson has told us, all entering students bring to the training process?

What is going on inside the training program as a social unit? Who is teaching what to whom and when and how? Linda Bain, Tom Templin, and Neal Earls all have suggested that we would do well to find out.

How can we improve the transfer and persistence record for the skills we teach our clients in preservice and inservice programs?

How do we go about improving the accuracy of movement perception and analysis by our students—in a reliable and cost-effective manner?

What do good elementary specialists really know about teaching and where, when, and how do they learn those things?

There are a dozen *chunks*. You may want to add some of your own, or merge, delete, and revise some of mine. Whatever the final form of the list, we have a substantial agenda. We did well to cover so much of it this time. Next time we will do even better. Certainly we must gather again, hopefully with a shorter interval than the 12 years between the Ozarks and Orlando. Where can we find a city that begins with *O* to keep the string alive?

The Role of Teacher Knowledge in Elementary Physical Education Instruction: An Exploratory Study

Edward Walkwitz and Amelia Lee

The purpose of this study was to describe how providing teachers with research based knowledge about developmental throwing can influence teachers' observational interpretations and their students' practice patterns. Eight kindergarten classroom teachers with high generic teaching skill competence taught a 6-week overhand throwing unit to the children in their intact classes. Prior to the unit, four of the teachers were randomly assigned to a 4-hour knowledge training program. The other four teachers served as a comparison group (underwent no knowledge training). During the unit, data from stimulated recall interviews were used to describe and compare the thoughts and knowledge concepts expressed by the two groups of teachers. The throwing practice experienced by the children in the knowledge-trained and comparison teachers' classes was videotaped and analyzed for frequency of opposite foot stepping. The knowledge acquired during training was associated with different patterns of skill observation. The knowledge concepts the teachers acquired during training formed the basis of many of their thoughts and were reflected in the instructional procedures implemented. The knowledge-trained teachers' classes demonstrated more than twice as many opposite foot throws during the unit than the comparison teachers' classes.

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During the last decade researchers in teaching and teacher education have become concerned with the role of professional knowledge in teaching (Leinhardt & Smith, 1985; Peterson, 1988; Peterson, Fennema, Carpenter, & Loef, 1989; Shulman, 1986, 1988; Wilson, Shulman, & Richert, 1987). These investigations have approached the study of knowledge from various perspectives and have emphasized that teachers draw on many components of subject matter and pedagogical knowledge as they plan and execute lessons.

An emerging conception of the knowledge base of teaching (Shulman, 1987) offers broad categories of knowledge believed to underlie the understanding and performance of good teachers. Pedagogical content knowledge is central to this knowledge base and is described by Shulman (1987) as a blend of subject matter and pedagogy. This important source of understanding enables teachers to transform their comprehension of content into representations, explanations, demonstrations, illustrations, and actions that can be ;understood by students of diverse abilities. Research from classroom studies suggests that pedagogical content knowledge most clearly distinguishes the content specialist from the expert classroom pedagogue (Shulman, 1987, 1988) or the novice classroom teacher from the skillful veteran (Gudmundsdottir & Shulman, 1987).

Although the nature of pedagogical content knowledge in physical education is not clearly defined, a central dimension is the teacher's ability to reorganize subject matter knowledge to make it teachable. Subject matter knowledge includes the ideas, facts, and concepts in a field (Wilson et al., 1987) and represents a teacher's comprehension of the content to be taught. An understanding of movement content, however, must be bridged with a knowledge of teaching and translated into teaching actions. According to Shulman (1987) the key to distinguishing the knowledge base of teaching lies at the intersection of content and pedagogy, the ability to transform subject matter knowledge into a set of strategies to conduct a lesson or unit.

This study was an initial attempt to gain insight into the nature of pedagogical content knowledge in physical education. The focus was on how the knowledge veteran teachers have about the mechanical aspects of throwing is transformed and used during classroom instruction. It seems logical that the level of knowledge a teacher has influences what is observed about a student's performance during practice and what is done after a learner's response is deemed appropriate or lacking. The skill of observing and the development of observational skill in preservice physical education teachers has received attention during the last decade (Barrett, 1983; Bell, Barrett, & Allison, 1985; Hoffman, 1983). Research (Armstrong & Hoffman, 1979; Imwold & Hoffman, 1983) has shown a relationship between expertise in various sport domains and the ability to observe. Other researchers (Allison, 1987; Barrett, Allison, & Bell, 1987; Bell et al., 1985) have described what preservice teachers observe during unguided field experiences. The present research, which is part of a larger study, extends this work in two important ways: teachers were studied during teaching to determine not only what they observed but also what they did after an observation, and a major focus was the subject matter knowledge of teachers and the ways this knowledge was translated into classroom events. Specifically, the purposes of this study were (a) to describe patterns of concerns and observational interpretations of teachers with different levels of knowledge, (b) to describe the nature and content of the knowledge embedded in the thoughts of teachers with different levels of knowledge, and (c) to describe the practice patterns of students taught by teachers with different levels of knowledge. Achievement scores measuring the developmental body actions and throwing distances of students taught by teachers with different levels of knowledge were also analyzed and are reported in another article (Walkwitz, 1991).

Method

Subjects

Eight kindergarten classroom teachers from eight city schools who possessed high levels of generic teaching skills competence served as subjects. Principals and supervisors nominated female kindergarten teachers with at least five years of professional experience who were respected and known to be effective. Volunteer subjects were sought from the nominations. The volunteers read and signed an informed consent form before participating in the study and completed a questionnaire that assessed their educational training and their physical education and sports backgrounds. The responses to the questionnaire revealed that the teachers had no experience playing baseball or softball. Two trained observers used the Teacher Assessment and Development System-Meritorious Teacher Performance (TADS-MTP) form (Performance Assessment Systems, Inc., 1984) to verify that the teachers could manage students and demonstrate a high number of generic teaching skills during classroom instruction. Eighty-five percent interobserver agreement was established as both observers assessed the teachers duirng the same period of classroom instruction.

The TADS-MTP form is an instrument that assesses generic teaching skills that are organized under three broad categories (i.e., teacher-student relationships, classroom management, techniques of instruction). Generic skills depend on knowledge of pedagogical principles and techniques that are not bound by topic or subject matter.

The selection procedures continued until eight teachers with limited throwing experience and high generic teaching competence (score of 65 or higher on the TADS-MTP form) were identified. Two of the ten nominated teachers did not meet the selection criteria. The TADS-MTP scores for the eight teachers ranged from 68 to 74 ($M = 71.38$, $SD = 2.45$). Four of the teachers were randomly assigned to an experimental (knowledge-trained) group. The remaining four teachers represented a comparison (not knowledge-trained) group.

Procedures

The eight teachers instructed a 6-week overhand throwing unit to their intact kindergarten classes, which ranged in size from 17 to 20 students. Each teacher was provided beanbags, dead tennis balls, newspaper balls, rubber playground balls, and two large cartoon targets. Any other materials could be used to instruct the lessons. Three of the five weekly 20-min lessons focused on the development of overhand throwing. To preserve a balanced curriculum, the teachers instructed activities other than throwing on the other two days. Classroom observations ensured that the teachers followed this weekly schedule.

Orientation and Training Sessions

Before the unit started, the teachers were oriented to the study and participated in three workshop sessions totaling 4 hours. Orientation and training sessions were held individually for each teacher so that the teachers could not discuss the content of the unit. Although the primary focus of the sessions differed for the experimental and comparison teachers, it was important to provide teachers within each group exactly the same information. Toward this end, the workshop content for each group was compiled into a booklet, a copy of which was given to each teacher.

Orientation. The teachers were introduced to the study and were provided written descriptions of their responsibilities. They were asked to plan and implement a 6-week (18 throwing lessons) unit, using the time as best they could for maximum development of overhard throwing technique (e.g., "body actions of a baseball throw"). The objective of the unit (which was identical for the two groups of teachers) was clearly stated verbally and in writing at this time. Teachers who wanted clarification of the objective (i.e., body actions) were encouraged to watch baseball games and baseball sports reports that were televised nightly in their area. The initial orientation time was spent discussing procedures for completing daily lesson logs, processing the parental informed consent forms for the students, and participating in the training, interview, and knowledge assessment sessions. Teachers were paid for their participation and signed a contract agreeing to fulfill the specified responsibilities. Included in the contract was a statement indicating that the teachers would not seek advice on how to teach the unit.

Practice time training. The comparison teachers were introduced to the concept of engaged time and exposed to strategies to maximize children's active learning time. The strategies emphasized the use of individual and small group formations, having equipment readily accessible, making maximal use of available equipment, and encouraging the active involvement of all children. The purpose of this training was to ensure that the children in the teachers' classes were provided many practice trials. This facilitated the phase of the study that investigated the quality of children's throwing practice patterns. The comparison teachers were also provided a 10-page manual describing games related to overarm throwing. None of the materials in the manual described any concepts related to overhand throwing technique or development.

Knowledge training. The four experimental teachers were exposed to current developmental literature related to the overhand (baseball) throw. A videotape training package was used to present the intratask development of the body actions during throwing. Key developmental changes in the actions of the feet, the pelvis-spine, and the arm were discussed (Roberton, 1984).

A mature throwing pattern was defined, and teachers were provided detailed information needed to evaluate the developmental levels within each component of the throw. The actions representing mature throwing form included (a) the foot opposite the throwing arm takes a long vigorous stride forward, accompanied by full weight transfer, (b) the throwing arm swings down and back followed by a forceful forward movement with the forearm lagging, and (c) the pelvis, spine, and shoulder rotate in a differentiated fashion.

Based on Shulman's (1986) Model of Pedagogical Reasoning, an effort was made to help the teachers buld pedagogical content knowledge. Emphasis was placed on getting teachers to think about how the mechanical aspects of throwing are influenced by the developmental characteristics of children. The knowledge training workshop did not address any of the important teacher functions during practice, such as observing student response and providing feedback to learners. In addition to the knowledge training, the experimental teachers were exposed to a shortened version of the practice time training provided the comparison teachers and were given the same 10-page manual.

Teacher Knowledge Assessments

The experimental and comparison teachers were administered overhand throwing knowledge assessments prior to and after the throwing unit. An observational task rather than a written test was used to measure knowledge. For both assessments, each teacher was shown six immature throwers on videotape and asked: "Do you have any thoughts about this child as a thrower?" and "If you observed him/her in your physical education class, what statements would you make to him/her, if any?" The statements were audiotaped, transcribed, and later content analyzed and coded by two trained independent coders with baseball experience. An overall knowledge score for each teacher was obtained by recording the number of references the teacher made to immature throwing actions, developmental stages, and instructional procedures that facilitate overhand throwing development. Each coder had access to a list of relevant concepts to assist in the scoring to ensure that only accurate responses were coded. Relevant concepts included any items of information related to the presence or absence of opposite foot stepping; weight transfer; differentiated body rotation; a swing of the throwing arm into a cocked position; a forceful, whip-like movement of the throwing arm; a forearm that lags behind the elbow; and a throwing arm that follows through toward the target area. The list of concepts also encompassed descriptions of specific developmental stages (Roberton, 1984) and any instructional procedures that encouraged children to perform more mature foot, pelvic-spine, and arm actions. Intercoder agreement for identifying the knowledge concepts exceeded 95%. Disagreements were later discussed and jointly resolved by the two coders.

Although relying on verbal responses of teachers may have resulted in some omissions of information, it was important to assess knowledge in a way that it was presented during the workshop training. Further, pedagogical content knowledge requires teachers to draw on what they know and apply it to teaching-learning settings. Measuring knowledge in this context would be difficult with a paper and pencil test. Other concerns that were considered in the design of the knowledge assessments were the advantages and disadvantages of testing the teachers at all. Although a test of any kind may sensitize subjects to information they are subsequently asked to provide (Campbell & Stanley, 1963), it was extremely important to verify that the workshop training was successful and to confirm that the experimental teachers were more knowledgeable than the comparison teachers before beginning the unit. The final test was used to make sure the knowledge was retained until completion of the unit.

The beginning of the unit knowledge assessment scores revealed that the experimental teachers possessed more knowledge of overhand throwing than the comparison teachers as evidenced by the number of developmental body actions, stages, and appropriate content-specific instructional strategies that they identified as they analyzed the videotaped throwers. The experimental and comparison teachers identified 153 and 14 throwing concepts, respectively. The end of the unit assessment indicated that the experimental teachers maintained this knowledge superiority over the entire unit (157 and 9 concepts, respectively).

Class Filming and Stimulated Recall Procedures

The teachers were videotaped on three occasions (once every 2 weeks) during throwing instruction. A stimulated recall interview was conducted after each filmed lesson. The teachers were shown the taped lesson and informed prior to the session that the purpose of the interview was to elicit thoughts, feelings, and reactions to the lesson. The teacher was in control of the videotape recroder and was free to stop the tape at any time. The researcher stopped the tape when the teachershifted learning activities, when the teacher provided assistance to individual students, or when a critical incident occurred that affected the flow of the lesson. Each time the videotape was stopped a series of questions developed from previous research (McNair & Joyce, 1979) was asked. Probe questions were (a) What were you thinking at that point? (b) What were you noticing? (c) Was there anything else you thought of doing at that point but decided against? and (d) What was it? Teacher responses to this series of questions represented an interview segment that formed the basis for subsequent analysis.

An instrument developed and first used in the South Bay Study (McNair & Joyce, 1979; Morine-Dershimer, 1979) served as a model to generate categories for coding teacher thoughts. The system allows the researcher to classify thoughts into types of concerns and information sources recalled during the interview. The concerns category was divided into elements relating to pupil learning and procedures. Teacher concerns about pupil learning include subcategories describing the nature of what a teacher reports noticing. Pupil learning concerns focus on throwing technique ("She was throwing with the feet planted together and she wasn't stepping"), throwing accuracy ("It seemed that the girls were having a harder time hitting the target"), and throwing performance in a general way ("She was doing the overhand throw incorrectly"). Concerns about procedures include a focus on instruction for learning ("...so what I was trying to do was to actually take her hand and show her how it felt to throw real hard. I was pushing her hand forward)", organization ("I just keep thinking how I can get more kids out there to help me collect equipment"), and management ("Jeremy wasn't participating again. He wass over by the hedge pulling the leaves off"). Informatin sources deal with the types of input used by the teacher to govern their actions. These include information from teacher observation (technique, accuracy, or throwing performance in a general sense), and information from other sources such as student verbalizations, sound, teacher recall, and teacher expectations. Because the present study was designed to describe how knowledge might influence a teacher's perception and interpretation of the flow of cues from students, developmental throwing concepts nested in the teacher thoughts were analyzed. The items of information (or knowledge concepts) embedded in the concerns and information sources were identified and described in detail. A teacher could mention more than one concern or more than one concept during an interview segment.

The stimulated recall analysis procedure was completed by two coders who trained until interrater agreement for coding the 10 subcategories and the 6 knowledge categories was 90%. The two judges coded the interview protocols in segments that required several readings. First, each transcription was read and discussed in terms of general patterns of meaning. Then the researchers independently identified the overhand developmental throwing concepts that were embedded in the teacher thoughts. With the third reading, the teacher concerns and information sources were identified and classified. Finally, the number of instructional procedures carried out in response to skill learning concerns about overhand throwing developmental body actions were recorded. An instructional procedure is any type of action reported by the teacher to facilitate student learning of skills, knowledges, or concepts (e.g., feedback, manual assistance, verbal instruction, demonstration, reinforcement of desirable body actions). During each segment, disagreements were discussed and the researchers reached consensus as to how the thought should be coded.

Chi-square tests were used to determine if the distributions of concerns and information sources expressed by the experimental and comparison teachers were the same. A chi-square was computed for each of three groups of frequency data: concerns dealing with pupil psychomotor skill learning, concerns about procedures, and information sources related to skill learning.

Quality of Throwing Practice

The frequency of opposite foot stepping was the criterion used to describe whether the instruction provided by the experimental teachers resulted in higher quality practice. Two trained raters employed slow motion and stop action replay techniques to analyze and rate two 3.5-min segments from each of the three lessons that were videotaped for the stimulated recall procedures. All lessons were conducted in an area marked by boundaries. This enabled the camera to be positioned so that most of the practice trials could be recorded for analysis. The numbers of throws that the children showed opposite foot action were recorded. Interrater agreement of 90% was established and maintained. Comparisons were made in the frequencies and rates ($\text{throws}\cdot\text{min}^{-1}$) of opposite foot throws demonstrated by the students who received instruction from the experimental and comparison teachers. A chi-square test was used to determine if the proportions of opposite/not opposite foot throws were the same for the experimental and comparison teachers' students.

Results and Discussion

Stimulated Recall Interview Analysis

Knowledge concepts. Findings from the stimulated recall interviews revealed that the developmental throwing concepts acquired during knowledge training appeared to form the basis of the experimental teachers' self-reported thoughts. When the transcripts of the experimental teachers were analyzed for items of information related to the technique of throwing, 385 concepts were nested within 259 of the 435 stimulated recall interview segments (see Table 1). The concepts encompassed opposite foot stepping, pelvis-spine rotation, forceful throwing, and a whiplike arm action accompanied by a forearm lag and a follow through toward the target area. The experimental teachers also made several references to stages of throwing and adapting equipment to facilitate throwing development. In contract, the four comparison teachers elicited 17 concepts distributed across 15 of the 366 interview segments. Fifteen of the concepts were expressed by two of the teachers and were largely limited to arm action and force production. One teacher made two references to body rotation.

Concerns and Information Sources. Table 2 presents the frequencies and percentages of concerns and information sources representative of the experimental and comparison teacher groups. Direct quotes revealed by the teachers during the stimulated recall interviews are also described. The chi-square analyses revealed that the concerns, $\chi^2(2, N = 506) = 161.64$, $p < .001$, and information sources, $\chi^2 (3, N = 761) = 208.86$, $p < .001$, were distributed differently for the experimental and comparison teachers. The most domi-

Table 1. Knowledge concepts embedded in the concerns and information sources of the experimental and comparison teacher groups

Knowledge Concepts	Experimental *n*	Comparison *n*
Degree of opposite foot stepping	144	0
Forceful throwing	90	6
Whiplike arm action/forearm lag/ follow through	74	9
Degree of pelvic-spine rotation	54	2
Developmental stages of throwing	16	0
Adapting equipment to facilitate throwing development	7	0
Total concepts	385	17

Table 2. Frequencies and percentages of concerns and information sources for the experimental and comparison teacher groups

	Experimental		Comparison	
	n	%	*n*	%
Pupil Skill Learning Concerns[a]				
1) Technique	213	63.6	12	7.0
2) Accuracy	103	30.7	103	60.2
3) General	19	5.7	56	32.7
Total	*335*		*171*	
Procedure Concerns				
4) Instruction (learning)	300	75.0	232	73.7
5) Organizing/equipment/facilities	73	18.3	57	18.1
6) Management	27	6.8	26	8.3
Total	*400*		*315*	
Skill-Related Information Sources[b]				
7) Observe technique	217	48.2	14	4.5
8) Observe accuracy	122	27.1	177	56.9
9) Observe skill perform (general)	27	6.0	78	25.1
10) Other sources (skill related)	84	18.7	42	13.5
Total	*450*		*311*	

[a] ($\chi^2[2, N = 506] = 161.64$, $p < .001$).
[b] ($\chi^2[3, N = 761] = 208.86$, $p < .001$).

nant differences between the two groups dealt with teacher concerns about student overhand throwing performance (Categories 1 through 3) and the sources of information used by the teacher during throwing instruction to govern their actions (Categories 7 through 10). The experimental teachers frequently expressed concerns about overhand throwing technique (Category 1) and depended heavily on observation of technique (Category 7). They did this by referring to the absence or appearance of opposite foot stepping, body rotation, and a whiplike arm action ("I noticed that she was throwing with the feet planted together and she wasn't stepping"). Similar cues were attended to during the observation of throwing performances that the teachers judged as desirable. The statements of the experimental teachers reflected a familiarity with the developmental body actions that determine mature and efficient overhand throwing ("I saw that she was rotating, pulling her arm back, and throwing hard"). The experimental teachers also focused on other sources of information (Category 10) to monitor skill learning related to developmental body actions (e.g., sound of ball to estimate the force of throws, teacher recall of past student performance related to technique).

Both groups of teachers showed a concern for and observation interest in throwing accuracy (Categories 2 and 8, respectively), which represents statements about pupil throwing outcomes. Previous research (Clark & Peterson, 1986) describing the content of teachers' interactive thoughts have used several broad categories (e.g., objectives, content, instruction, learner). This system allows a description of what the teacher is thinking about (i.e., outcome). When more specific categories are used for categorizing teacher thoughts, however, an analysis of how the teacher is thinking about throwing outcomes is possible. The knowledgeable teachers described more concerns about technique that will have an effect on outcome or accuracy. The absolute number of accuracy-related concerns expressed by the experimental and comparison teachers (103) was identical. However, the accuracy-related concerns demonstrated by the experimental teachers were often accompanied by interests in developmental throwing technique and/or throwing forcefully ("I observed that she was snapping/throwing the ball down and just bending at the waist instead of rotating"). In contrast, the comparison teachers showed concern and interest in accuracy without an accompanying emphasis on throwing forcefully or technique.

The comparison teachers expressed few concerns about and rarely focused their attention on the developmental body actions associated with mature/immature overhand throwing technique (Categories 3 and 9). They were cognizant of student throwing performance in a general/vague manner ("I noticed that he threw it but didn't do it correctly").

Both teacher groups frequently expressed concern for learning-related instructional procedures (Category 4). While the chi-square was nonsignificant, a qualitative analysis of the teacher responses revealed that the experimental teachers were 11 times more likely to initiate action that was directed toward specific developmental body movements. Seventy-six percent (238) of the 300 instructional procedure concerns that were revealed by the knowledge-trained teachers were accompanied by statements related to foot stepping, body rotation, and/or a forceful, whipping arm action ("She was throwing with the left hand but stepping with the left foot, so I was showing her to step on the opposite foot"). The instructional procedures included providing corrective/reinforcing feedback and verbal cues, manually assisting a child through the desired body actions, demonstrating throwing technique, adapting or adjusting equipment to facilitate the development of mature throwing patterns, and giving verbal instructions. Comparatively, only 16 (6.90%) of the 232 instructional procedure concerns that were cited by the comparison teachers were initiated or accompanied by developmental body action concerns. This group of teachers had a limited understanding of content-specific strategies to facilitate throwing development ("I noticed that he was throwing too hard. He always throws like he's trying to break the target. So I said that's too hard, you don't always have to throw that hard").

Throwing Practice Analysis

[illegible] analysis of the quality of throwing practice data in[illegible]ed that the experimental and comparison teachers experienced a similar number of throws (821 and 806 throws, respectively). The chi-square analysis revealed that the experimental ($n = 677$, 82.46%) and comparison ($n = 259$, 32.16%) teachers' classes differed with respect to the proportions of opposite/not opposite throws observed during the lessons, χ^2 (1, $N = 1{,}627$) = 419.55, $p < .01$. The experimental teachers' classes averaged 8.46 opposite foot throws-min^{-1}, whereas the comparison group classes averaged 3.24. This suggests that the experimental teachers were better able to structure the learning activities so that their pupils practiced higher quality throws. Results from another phase of this research indicated that the level of teacher knowledge also had a positive influence on student achievement in throwing (Walkwitz, 1991).

Conclusions

The link between knowledge acquired during training and verbal reports of thoughts in this study supports the argument regarding the role of well-developed subject matter and pedagogical content knowledge in teaching expertise. The experimental teachers integrated the material studied with what they already knew about effective teaching and were able to use the knowledge to assess their students' performance during practice. The principles and concepts presented in the workshops made a difference in these teachers' patterns of concerns and observational interpretations and were ultimately reflected in student practice. The idea that the teacher must connect newly acquired concepts with prior knowledge is not new. A century ago William James (1900) suggested that science is not something that can be translated automatically into a technique to be used in classrooms. Rather, the teacher must make the application. More recently, Shuell (1986) emphasized that good teachers are not merely people who can articulate facts and ideas. Rather, effective teaching involves the ability to get students actively involved in a planned learning sequence appropriate for the desired outcomes. This task requires a teacher to understand the relationships among the relevant facts and ideas and translate this knowledge into informed instructional actions.

This study is only a beginning and needs to be expanded and refined. Although the results contribute to a better understanding of the complexities of teachers' thoughts, observational patterns, and reactions during teaching, longitudinal research that studies how knowledge is gained over time is needed. Because the present study relied on an intervention to assist a group of teachers in building subject specific pedagogical knowledge, there is always a possibility that the knowledge concepts embedded in the thoughts of the trained teachers represented rudimentary skill-specific vocabulary rather than a well-developed knowledge structure about developmental throwing. The trained teachers in this study were only able to represent movement information for students in ways based on their trained knowledge of throwing mechanics.

Additional research is needed to uncover the analogies and metaphors expert physical education teachers who have developed complex knowledge structures over an extended period of time might use to help students learn. It might also be useful to explore the unique contributions of subject matter and pedagogical content knowledge. Although this early effort did not permit this separation, it does help situate research about teacher knowledge in physical education.

References

Allison, P.C. (1987). What and how preservice physical education teachers observe during an early field experience. *Research Quarterly for Exercise and Sport*, 58, 242-249.

Armstrong, C.W., & Hoffmann, S.J. (1979). Effect of teaching experience, knowledge of performer competence, and knowledge of performer outcome on performance error identification. *Research Quarterly*, 50, 318-327.

Barrett, K.R. (1983). A hypothetical model of observing as a teaching skill. *Journal of Teaching in Physical Education*, 3(1), 22-31.

Barrett, K.R., Allison, P.C., & Bell, R. (1987). What preservice physical education teachers see in an unguided field experience: A follow-up study. *Journal of Teaching in Physical Education*, 7, 12-21.

Bell, R., Barrett, K.R., & Allison, P.C. (1985). What preservice physical education teachers see in an unguided, early field experience. *Journal of Teaching in Physical Education*, 4, 81-90.

Campbell, D.T., & Stanley, J.C. (1963). *Experimental and quasi-experimental designs for research*. Boston: Houghton Mifflin.

Clark, C.M., & Peterson, P.L. (1986). Teachers' thought processes. In M.C. Whitrock (Ed.), *Handbook of research on teaching* (3rd ed., pp. 255-296). New York: Macmillan.

Gudmundsdottir, S., & Shulman, L. (1987). Pedagogical content knowledge in social studies. *Scandinavian Journal of Educational Research*, 31, 59-70.

Hoffman, S.J. (1983). Clinical diagnosis as a pedagogical skill. In T.J. Templin & J.K. Olson (Eds.), *Teaching in physical education* (pp. 35-45). Champaign, IL: Human Kinetics.

Imwold, C.H., & Hoffman, S.J. (1983). Visual recognition of a gymnastics skill by experienced and inexperienced instructors. *Research Quarterly for Exercise and Sport*, 54, 149-155.

James, W. (1900). *Talks to teachers on psychology*. New York: Holt, Rinehart, & Winston.

Leinhardt, G., & Smith, D.A. (1985). Expertise in mathematics instruction: Subject matter knowledge. *Journal of Educational Psychology*, 77, 247-271.

McNair, K., & Joyce, B. (1979). *Teachers' thoughts while teaching: The South Bay study, part II* (Research Series No. 58). East Lansing, MI: Institute for Research on Teaching.

Morine-Dershimer, G. (1979). *Teacher plan and classroom reality: The South Bay study, part IV* (Research Series No. 60). East Lansing, MI: Institute for Research on Teaching.

Performance Assessment Systems, Inc. (1984). *Teacher Assessment and Development System: MTP form*. Miami: Dade County Public Schools.

Peterson, P.L. (1988). Teachers' and students' cognitional knowledge for classroom teaching and learning. *Educational Researcher*, 17(5), 5-14.

Peterson, P.L., Fennema, E., Carpenter, T.P., & Loef, M. (1989). Teachers' pedagogical content beliefs in mathematics. *Cognition and Instruction*, 6, 1-40.

Roberton, M.A. (1984). Changing motor patterns during childhood. In J. Thomas (Ed.), *Motor development during childhood and adolescence* (pp. 48-90). Minneapolis: Burgess.

Shuell, T.J. (1986). Cognitive concepts of learning. *Review of Educational Research*, 56, 411-436.

Shulman, L.S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4-14.

Shulman, L.S. (1987). Knowledge and teaching: Foundations of a new reform. *Harvard Educational Review*, 57, 1-22.

Shulman, L.S. (1988). *Knowledge growth in teaching: A final report to the Spencer Foundation*. Stanford: Stanford University, School of Education.

Walkwitz, E. (1991). Effect of teachers' subject matter knowledge and pedagogical content knowledge on children's skill practice and overhand throwing development. *Abstracts of the 1991 AIESEP/NAPEHE World Congress—Collaboration between researchers and practitioners in physical education: An international dialogue*, 199.

Wilson, S.M., Shulman, L.S., & Richert, A.E. (1987). "150 different ways" of knowing: Representations of knowledge in teaching. In J. Calderhead (Ed.), *Exploring teachers' thinking* (pp. 104-124). London: Cassell.

Early physical education experiences—those prior to undergraduate preparation—are very influential in the formation of classroom teachers' perceptions of physical education.

Physical Education Revisited
The Institutional Biographies of Preservice Classroom Teachers

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The professional career pattern that teachers follow begins long before their entrance into preservice teacher education programs (Britzman, 1986; Houle, 1980; Lortie, 1975). As students for a dozen or more years before enrolling in a college or university teacher education program, future teachers "have already accumulated a rich set of cultural beliefs and myths about teaching and learning in their institutional biographies" (O'Loughlin, 1988, p.2). (Britzman [1986] defined institutional biography as "the historical experience of lives lived in compulsory education" [p.452].)

As Brumbaugh (1987) explained, there has been limited research into how classroom teachers' perceptions of physical education form and what influence those perceptions have on their teaching of physical education. This small body of research supports the notion, however, that early physical education experiences—those prior to undergraduate preparation—are very influential in the formation of classroom teachers' perceptions of physical education (Akers, 1985; Brumbaugh, 1987; Nokken, 1971; Phillips, 1967). This study was undertaken to gain insight into the physical education institutional biographies of 120 elementary education majors (113 females, 7 males) enrolled in a three-hour elementary school physical education methods course. All students enrolled in five sections of this course during one academic semester agreed to participate.

In grades kindergarten through six, the majority (93%) of the undergraduates attended schools in the midwest and participated in physical education programs taught by a specialist (81%). The preservice teachers were asked to report in anecdotal form their most memorable elementary school physical education experience, including their grade level at the time, setting, how they felt about the experience, and why it was memorable. The anecdotes were subjected to inductive analysis (Patton, 1980) to identify common characteristics in the preservice teachers' physical education institutional biographies. Insight was gained concerning six characteristics: (1) success, (2) embarrassment, (3) physical injury, (4) gender equity, (5) special events and equipment, and (6) teachers.

Memories of success

One common characteristic identified by the preservice teachers was a feeling of success. Comments most frequently related to one of three situations: (1) participation in special events, (2) recognition by the teacher, or (3) the accomplishment of an individual goal.

Preservice teachers related memories of receiving physical fitness awards, winning school tournaments,

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earning ribbons on field days, and hearing parental applause during gymnastics shows. For example:

> I was an average athlete but had helped to make my relay team win. It really made me feel good to walk around with a ribbon. It didn't even matter to me that other kids had more than one. I was proud that I helped the winning team.

> I think the most rewarding part of gymnastics was when after all my hard work, it paid off. When we did competition or rather an exhibition, I did extremely well. I was proud of myself and realized that with persistence and hard work I could do just about anything I wanted and succeed.

Some of the preservice teachers also remembered experiencing pride when their physical education teacher singled them out based upon their skill levels. For example,

> I remember once when we were involved in track and field events. I was doing the high jump and he [the teacher] came over and gave me a few pointers. He also told me that I had good form and I had a lot of potential. He told my parents about it also. I remember this because he made me feel so good. I was very proud of myself and it made me push myself a little bit harder. Just a little bit of extra attention was enough to boost my confidence.

> Because I had always enjoyed gymnastics, I decided to do an individual routine. After I did my routine the teacher said that my routine would be on [video] tape. I can still remember the satisfaction I felt.

Feelings of accomplishment and pride were also expressed when, as elementary school students, preservice teachers accomplished individual goals:

> My most memorable experience was gymnastics... The thing that really makes this stick out in my mind as that I finally did a back summy. It was exciting.

> Halfway through the race I began to pass my peers. I felt great as I blew past their winded bodies. As I neared the finish line, I passed the last of my classmates. I was running strong and I was in first place. As I watched the remainder of my class cross the finish line, I felt great. I had achieved something I didn't think I was very good at. This is the reason I still remember it today.

> Finally, my turn came up. I kicked the ball with all my might [and] made a home run. I felt like I achieved a goal and wasn't a loser.

Feelings of success were a part of many of the preservice teachers' physical education institutional biographies. As one individual described the most memorable experience, "This was a super experience for me and it has stuck with me because it was a moment in my elementary years where I felt proud and talented." Thus, pride and achievement associated with participation in special events, recognition by the teacher, or accomplishment of an individual goal were significant contributors to the memorability of particular physical education experiences.

Memories of embarrassment

Many of the preservice teachers reported experiences associated with embarrassment in their physical education institutional biographies. As one explained, "It was memorable not because it was a great personal triumph, or because it was outstanding in the eyes of my peers; no, it was just downright embarrassing." A large group of the reported experiences was related to the preservice teachers' perceptions of themselves as unskilled elementary school students. Sometimes these perceptions were based upon their elementary school classmates' reactions to their lack of motor skill.

One individual remembered her peers' reactions to her failure to climb a rope during their physical education class: "Most of the kids laughed at me and teased me for what seemed like weeks." In other reports, some preservice teachers indicated their perceptions were based more on self-evaluation. For example, one stated, "I always felt uncomfortable around the rest of my class because I never felt like I was as good as I should be." For several of these individuals, their feelings of inadequacy were of enough significance to negatively color their entire physical education experience. One related, "I was never really a very athletic child and for this reason, my elementary physical education class was always a terrible experience."

Other preservice teachers reported experiencing embarrassing moments that included being the last student picked when captains selected their team members; being the heaviest girl in class and having to wear "an ugly blue gym suit; "dancing with the stupidest and ugliest boy" in the class; being teased by the boys for being a skilled girl; and attempting to kick a ball, missing, and landing on the ground. Some of the preservice teachers used words such as "humiliating" and "incredibly embarrassing" to describe their most memorable experiences.

Although some of these individuals indicated that their embarrassing moments did not have a lasting influence on their overall enjoyment of physical education, others indicated that the moment described reflected their total perception of physical education.

One preservice teacher summed up her memories by explaining that when she thought of elementary school physical education she remembered feelings of fear, sadness, and embarrassment. The power of embarrassment to raise an experience to the status of most memorable was clearly evident in these anecdotes.

Memories of physical injury

A number of the preservice teachers related memorable expriences that centered on an injury that occurred in physical education. The reporting of anecdotes included the hurt and pain associated with the injury; how the situation was treated by others, primarily the teacher; and the effect of the injury situation on future participation.

The feeling of pain was a powerful memory. Statements such as "I was in a lot of pain" and "I tried to play it off like it didn't hurt" were part of the recounting of the events. One preservice teacher vividly remembered an injury that occurred during a dodgeball game in the fifth grade:

> I wasn't watching behind me and [started] running backwards. Nicole Francis must have been doing the same thing. Nicole and I collided, hit heads and both fell down. I still remember how much it hurt.

Being injured in front of one's teacher and classmates makes the injury public. How others responded to the accident situation was a major part of the experience for some of the preservice teachers. They spoke of the concern and the care demonstrated by the teacher through acts such as treating the injury and helping them laugh through the embarrassment and by classmates rushing over to see if they were hurt. They also spoke negatively of teachers who would not believe they were hurt when injured and forced them to continue to participate.

For some of the participants, the pain and publicness of the incident resulted in a future dislike for the activity in which they were participating when injured. For example, a student who fell off the balance beam "never enjoyed gymnastics as much" again. For others, the injury did not dampen enjoyment of the activity. Students continued to "like gym," "love volleyball," and "participate regularly in class" even though their memorable experience was one of injury and pain.

As seen in these examples, a physical injury is readily remembered by the individual involved. The context of the injury situation, including the associated pain, how the situation was treated by others, and the effect on future participation were important components of the memories of these preservice teachers.

Memories of gender

Concerns related to gender are also part of the preservice teachers' physical education institutional biographies. The participants reported memorable experiences in which the stereotypic identification of certain behavioral characteristics to one gender or the other was present: specifically, that boys were expected to perform better than girls in physical activities. For example,

> Well, I ended up winning [Jump the Creek] which was quite a shock to everyone in the class because I was new and a *girl*! The event went around the whole school that a new girl beat all the boys in her class.

When this girl outperformed the boys in her class and broke through the stereotype, the experience was memorable to her.

Gender as the determining factor in class organization (i.e., boys vs. girls) was the context for some of the memorable experiences for these participants as well:

> The whistle tweeted its shrill yelp as Mrs. Casey tucked her stringy black hair behind her ear. "OK," she yelled, "squad leaders, report to me for your team selections." All of us girls huddled in the corner because we knew by the look in her eyes and the way she tossed the red ball that Mrs. Casey had chosen dodgeball for today's 2nd grade gym class exercise. The boys were on one side and the girls on the other side of the makeshift cafeteria-gymnasium. The whistle sounded and the game began.

Gender operated in a different way for some of the preservice teachers when incidents became memorable because of the interaction between an individual female student and an individual male student. The identified experiences were limited to the fourth, fifth, and sixth grades and all occurred during square dance units. One participant said,

> Dancing with a few of [the boys] wasn't too bad, but there was one boy that no one wanted to get stuck with. The day I remember getting assigned to him [as a partner] makes up the most vivid memory I have of gym class in elementary school.

Another female, a former fourth-grade student said, "I remember when we had to do square dancing and I got the ugliest boy in my whole class. I remember being sick the next time we had gym."

Gender issues related to the context of schooling were in evidence in students' and teachers' behaviors in physical education classes. Stereotyping, class organizational structure, and individual interactions were framed by the notion of gender, making a particular class experience memorable.

Memories of special events/equipment

Special events planned and organized as part of the physical education program and special equipment brought into the class were the substance of memorable experiences for some of these former elementary school students. Specific events and equipment described were fitness testing, field days or Olympic-type activities, interclass and interschool tournaments, gymnastics shows for parents, and the parachute and trampoline. The events and equipment were described as fun, exciting, new, competitive, different, fascinating, rewarding, engaging, and often provided time off from the regular routine of classes.

As elementary school students, the preservice teachers particularly liked the excitement and variety a special activity brought to the program. In writing about playing with a parachute, one participant said, "I remember it very well because it was so exciting and new. It wasn't hard, just fun for everyone."

The competitive nature of some special activities also contributed to the memorableness of physical education experiences. The preservice teachers could recall the specific events in which they were entered for field days, how they placed in each event, and how they felt getting and wearing their award ribbons (which one person admitted still having).

Memories of teachers

The participants in this study frequently indicated that their teachers were central to their most memorable experiences in elementary school physical education. The teacher's physical characteristics, disposition, actions, strengths, and weaknesses were significant details provided in the anecdotes. As elementary school students, the preservice teachers reported looking to their physical education teachers for instruction and fair and just treatment, but, unfortunately, they did not always find them.

Some individuals described being forced to attempt skills they knew they could not do, without the benefit of any instructional assistance from their teachers. Many of these same individuals then expressed disappointment and anger that their teachers did nothing to suppress their classmates' giggles and teasing comments when they were unsuccessful. One individual who described herself as overweight, clumsy, and having a hip problem shared the following anecdote:

> The thing that bothered me the most was that the teachers never took the time to try to help me. I was almost a bother to them. [I was] a problem that they didn't have time to deal with. They also never stopped the other children from making fun of me. I think if they had at least done that it would have helped the hurt I felt inside immensely.

Another preservice teacher explained the extent of her teacher's instruction had been the selection of two skilled children to be team captains and then standing by while the more athletic students debated which of the poorly skilled children, if selected, would be the least likely to make their team lose.

As the examples show, many of the preservice teachers remembered their teachers' lack of respect for students. Other examples included the teacher forcing students to participate in activities when injured; being in a new school and having to stand in front of the entire physical education class until the teacher's way of doing a jumping-jack variation was learned; a child winning a fourth place ribbon in a field day event and then being told by the teacher that she should have let her brother run in that event because he was a better runner; the girls in the class being "pushed aside" and forced to abide by special rules because the teacher was "super male-oriented"; a male teacher hitting a student during a dodgeball game leaving a bruise on her leg that lasted for two weeks; and a teacher putting pressure on a child to perform well in all physical activities because she demonstrated a high level of skill in two sports.

In their reports, several preservice teachers suggested very strong negative feelings toward their former teachers. One individual described her teacher as a "terrible wicked teacher" and another stated that her teacher was "the meanest woman alive." A third individual expressed fear of her teacher when she stated,

> She was very rough and in my opinion should not have been an elementary physical education teacher. The thing I remember the most about it was that she would bang people's heads together if they got out of line.... She wouldn't do it hard enough to really hurt but it didn't tickle.... The reason this stands out in my mind is because she had me, as well as many other students, scared.

A few preservice teachers painted a verbal picture of their elementary school physical education teachers that resembled a drill sergeant. Many of the anecdotes contained references to teachers being overly strict and orderly. For example, one undergraduate wrote, "She [the teacher] would stand at the top of the steps and watch over us like a hawk to be sure we were doing all the orders that she bellowed out."

Although a significant number of the anecdotes regarding teachers were not complimentary and very few involved descriptions of teachers helping students learn, a number portrayed the teachers in a positive manner. Some teachers were described as nice, well-qualified, skilled, fair, concerned, encouraging, supportive, and fun. Participants explained that teachers perceived as well-qualified and fun were the individuals who provided exposure to new experiences and the greatest variety of organized games and group activities.

Negative and positive memories of elementary school physical education teachers were indeed a significant part of the preservice teachers' physical education institutional biographies. The depth of feelings regarding their former teachers indicated the importance of the role of the teacher in the formation of perceptions about physical education.

It is imperative to begin work with preservice elementary school teachers at the point that this study concludes. In preservice programs, future teachers must be encouraged to challenge the experiential baggage that they carry with them into their profession. Specifically, if elementary school teachers are to teach physical education, they should spend time in their preservice physical education methods course confronting and critically examining their physical education institutional biographies. For example, lead group discussions on memories of positive and negative experiences in elementary school physical education and the factors that influenced these experiences. Ask students to write insight papers or keep personal journals that compare what they learn in their methods courses to their experiences in physical education at the elementary school level. By helping students take a serious look at their histories, they may be able to more clearly make choices about the experiences they will design and conduct for their future students.

References

Akers, P.A. (1985). Value orientations of elementary classroom teachers toward physical activity for themselves and the children they teach. Unpublished doctoral dissertation, University of North Carolina at Greensboro.

Britzman, D.P. (1986). Cultural myths in the making of a teacher: Biography and social structure in teach education. *Harvard Educational Review*, 56, 442-456.

Brumbaugh, J.I. (1987). A view of physical education: Perceptions of five classroom teachers. Unpublished doctoral dissertation, University of North Carolina at Greensboro.

Houle, C.O. (1980). *Continuing learning in the professions*. San Francisco: Josey-Bass.

Lortie, D.C. (1975). *Schoolteacher: A sociological study*. Chicago: University of Chicago Press.

Nokken, C.P. (1971). Elementary classroom teachers' attitudes and practices relating to physical education. Unpublished doctoral dissertation, University of Northern Colorado.

O'Loughlin, M. (1988, October). Reconceptualizing educational psychology to facilitate teacher empowerment and critical reflection. Paper presented at the annual meeting of the Midwestern Association for Teachers of Educational Psychology, Bloomington, IN.

Patton, M.Q. (1980). *Qualitative evaluation methods*. Beverly Hills, CA: Sage.

Phillips, M.B. (1967). An investigation of elementary classroom teachers' perceptions of their role in teaching physical education. Unpublished master's thesis, Kent State University.

Research on Children and Children's Physical Education

The inclusion of a section on research illustrates that children's physical education is receiving attention from researchers. Specifically, the topics for researchers' attention in these selected articles are fitness, test reliability, academic learning time in physical education, and student decision-making. The Pissanos and Temple article, a report of a naturalistic research inquiry, describes a project that includes the physical education specialist and classroom teachers working together to achieve physical education program goals.

Are American Children and Youth Fit?

Charles B. Corbin and Robert P. Pangrazi

We analyzed data from the National School Population Fitness Survey (Reiff et al., 1986) and data collected by the authors of the original study to assess the fitness of American children and youth based on the results of additional analyses. We then compared the numbers of children and youth meeting norm-referenced standards to numbers meeting recently adopted criterion-referenced health (CRH) standards for individual test items in the Fitnessgram (Institute for Aerobics Research, 1987) and AAHPERD Physical Best (AAHPERD, 1988) test batteries. The number of children and youth meeting CRH standards for multiple items in a test battery was also determined. Finally, data were analyzed to determine if changes in fitness have occurred among American children and youth over recent decades. Our results suggest that, with the exception of measures of arm and shoulder girdle strength/endurance, more children and youth meet criterion-referenced health standards than norm-referenced standards (50th percentile) and the majority of American children and youth meet CRH standards for individual test items. However, the majority of American children and youth cannot meet the CRH standards for a battery of items for either of the two batteries studied. A second look at decade to decade comparisons of fitness produced evidence that questions the idea that youth are less fit now than in previous years.

Although physical fitness testing has been conducted in schools in the United States since the late 1880s, not until Kraus and Hirschland (1954) compared the fitness of American to European children did testing become widespread. The Kraus-Weber Test battery was used and contained six "pass-fail" tests designed to measure minimal levels of strength and flexibility. The Kraus and Hirschland results showed that nearly 60% of American youth failed at least one item, whereas less than 10% of children from three different European countries failed as many as one item. The research using the Kraus-Weber battery had a significant cultural impact. The Kraus-Hirschland report was chronicled by *Sports Illustrated* magazine (Boyle, 1955) as the "report that shocked the President." Indeed, President Eisenhower was so concerned about the fitness of American youth that the President's Council on Youth Fitness (now the President's Council on Physical Fitness and Sports—PCPFS) was established to promote youth fitness nationwide. Although it was generally conceded at the time that relatively low levels of fitness existed among American youth (Kirschner & Glines, 1957; Kraus & Hirschland, 1954; Noguchi, 1956), it was also generally held that the Kraus-Weber was a minimal test of fitness not capable of measuring all important components of youth fitness (Phillips, 1955).

For this reason, a special committee of the American Alliance for Health, Physical Education, Recreation and Dance (Note 1) Research Council developed a seven-item national youth fitness test battery designed to comprehensively evaluate the fitness of American youth (AAHPER, 1958). In 1958, AAHPER, in cooperation with the University of Michigan, published a survey of the fitness of American youth. In 1965 and 1975, AAHPERD and the University of Michigan, with grant support from the U.S. Office of Education, conducted follow-up surveys (AAHPER, 1965; AAHPERD, 1976). The intent of these jointly

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sponsored studies was to assess the fitness of youth each decade. In 1985 the President's Council on Physical Fitness and Sports assumed control of the National School Population Fitness Survey (NSPFS), which was sponsored by a U.S. Department of Health and Human Services grant. The primary analyses of the NSPFS data were reported in a monograph by Reiff et al. (1986).

Defining Physical Fitness

The results of the various surveys, including those from the 1985 NSPFS study, provide much of the evidence that is used to judge the past and current fitness of American children and youth. It should be noted, however, that the definition of fitness has changed considerably over the years. The first youth fitness tests (AAHPER, 1958) included items measuring abilities considered to be important physical education objectives. For example,"proficiency in running and jumping" was included in an attempt "to measure different components of fitness" (AAHPERD, 1976, p. 10). Health criteria were not central to the selection of test items as was the case for the Kraus-Weber test that preceded it.

Through the years, various test items measuring parameters considered to be "skill related" rather than "health related" were deleted from the Youth Fitness battery (AAHPER, 1965, 1976). As noted in Table 1, the softball throw, which was part of the original battery, was deleted as a test item in 1975. By 1985 the long jump and the 50-yard dash had been deleted from national test batteries.

The deletion of skill-related test items can be attributed to the evolution of the definition of physical fitness characteristics associated with good health and the prevention of health problems associated with inactivity. The health-based definition of fitness urged by Kraus and associates in the 1950s was reinforced and expanded in the physical education literature in the 1960s and 1970s (Corbin, Dowell, Lindsey, & Tolson, 1970; Johnson, Updyke, Stolber, & Schaefer, 1966). In 1980, AAHPERD published the first health-related physical fitness battery (AAHPERD, 1980), including only items thought to be associated with good health. All of the items measuring proficiency in running, jumping, and throwing were omitted for this battery. The current definition of fitness recognized by experts (Caspersen, Powell, & Christenson, 1985; Pate, 1983, 1988) includes those parts of fitness that relate to good health. Specifically the essential components of physical fitness are cardiovascular fitness, flexibility, muscular strength/endurance, and body composition. Both the American College of Sports Medicine (1988) and the American Academy of Physical Education (1987) have endorsed health-related definitions of physical fitness.

Goals for the nation for 1990 and the year 2000 are primarily based on increasing daily levels of physical activity. These changes in physical activity levels are designed to improve health-related fitness consistent with current definitions (Simons-Morton, Parcel, O'Hara, Blair, & Pate, 1988). Based on national health goals, a number of experts have urged that the fitness of children and programs dedicated to improving fitness and activity levels for children should be viewed from a public health perspective (Sallis & McKenzie, 1991; Simons-Morton, O'Hara, Simons-Morton, & Parcel, 1987). For the purposes of this study, the essential health-related fitness components described above will provide the standard for judging the fitness of American children and youth. Test items that focus on these fitness components are used in this analysis.

Norm-referenced Versus Criterion-referenced Health Standards

At the time of the primary analysis of NSPFS data, criterion-referenced (CRH) health standards had not yet been developed. Assessments of the fitness

Table 1. Items in AAHPERD, PCPFS, or Fitnessgram test batteries

	1958	1965	1975	1980s
Pull-ups	x (boys)	x (boys)	x (boys)	xyz (boys/girls)
Modified pull-up (girls)	x			
Sit-ups (straight leg)	x	x		
Shuttle run	x	x	x	y
50-yd dash	x	x	x	
Long jump	x	x	x	
Softball throw	x	x		
600-yd run/walk	x	x	x	
Flexed arm hang		x (girls)	x (girls)	z (girls)
Sit-up (flexed leg-timed, arms behind head)			x	
Sit-up (flexed leg-timed, arms across chest)				xyz
Mile run				xyz
Sit and reach				xyz

Note. x = items from AAHPERD (AAHPER) batteries (AAHPER 1958, 1965, 1976, 1988); y = items from PCPFS battery (USDHHS, 1987); z = items from Fitnessgram battery (Institute for Aerobics Research, 1987).

levels of chidlren and youth were based primarily on norm-referenced standards. The use of norm-referenced standards makes it possible to compare the performance of a child or a group of children to a known reference group. The 50th percentile has been the most often used standard for assessing the fitness of children and for making interyear comparisons.

CRH standards are scores for a specific test item that are established based on criteria thought to produce a health benefit or reduce the risk of a specific health problem. Typically, standards are established by a panel of experts who make decisions based on the best scientific evidence available. As additional evidence becomes available, the standards are adjusted. CRH standards can only be established for test items when a health rationale can be provided. When well documented, CRH standards are less arbitrary than norm-referenced criteria and become useful in efforts to improve public health. The reader is referred to Cureton and Warren (1990) for a more complete discussion of the advantages and limitations of CRH standards. Looney and Plowman (1990) have also suggested techniques for validating CRH standards. In recent years, two widely used national fitness test batteries, Fitnessgram (Institute for Aerobics Research, 1987) and AAHPERD Physical Best (AAHPERD, 1988), have adopted CRH standards.

Purpose

The purpose of this study was to reexamine the questions posed in the original NSPFS research. The original analysis (primary analysis) used norm-referenced standards (percentiles) as the principal method for assessing the fitness of American children and youth. This secondary analysis, which includes additional analyses, contrasts the fitness of children and youth using CRH standards versus norm-referenced standards.

Method

Data used for this study were obtained from a tape purchased from the University of Michigan, the agency commissioned to conduct the survey for the President's Council. A four-stage equal probability sample of the public school population was used to select subjects. The reader is referred to the NSPFS monograph (Reiff et al., 1986) for more details.

Subjects

Subjects were youth who participated in the 1985 PCPFS National School Population Fitness Survey (N = 18,857). For this secondary analysis, boys and girls between the ages of 6 and 17 were studied. Subjects younger than 6 and over 18 were excluded from the analyses. Also, 4,729 of the subjects had missing scores on one or more variables. Therefore, the number of subjects for specific analyses were as few as 14,128 (6,571 girls and 7,557 boys).

Test items

Nine items were administered as part of the NSPFS survey. Each of the items and the component of fitness that it measures is presented in Table 2. A complete description of each item is available (Reiff et al., 1986).

Testing Procedures

Subjects were tested in almost all cases in physical education classes by physical education teachers. Prior to the testing, it was determined that it was not feasible to have each subject take all nine tests in the survey. For this reason tests were allocated into three different test modules. Module A included the mile run, the long jump, and the arm hang; Module B included pull-ups, the 50-yd dash, and the shuttle run; and Module C included sit-ups, the sit and reach, and the 2-mile walk. All subjects took two of the three test modules for a total of six tests each. Group 1 took Modules A and B, Group 2 took Modules A and C, and Group 3 took Modules B and C. None of the subjects took all of the items found in any current national fitness battery.

Data Analyses

In addition to extensive data analyses completed as part of the original NSPFS study (Reiff et al., 1986), analyses were conducted including the percentage of subjects meeting CRH standards and percentage of subjects meeting CRH standards on multiple test items.

Results

A secondary analysis of the data was conducted to answer two major questions. A discussion of the results is included with each question.

Question 1: Are American Children and Youth Physically Fit?

The NSPFS summary and conclusions noted that there is "still a low level performance in important components of physical fitness by millions of children" (p. 45). Singled out for special emphasis were the low level of cardiorespiratory fitness, the low level of trunk flexibility, especially for boys, and the significant weakness of boys and girls in upper arm and shoulder girdle strength and muscular endurance. The summary statements and conclusions have been widely used by the media to establish the lack of physical fitness among American children and youth.

Passing Rates for Individual Test Items

Comparison to recently established CRH standards allows an alternative view of the fitness of children and youth. Tables 3 and 4 delineate the percentage of NSPFS children and youth meeting CRH standards for individual test items in the Fitnessgram and AAHPERD Physical Best test batteries.

In general, if CRH standards are used as indicators of child and youth fitness, many more children are judged to be fit than if norm-referenced standards (50th percentile) are used. Because pass/fail rates differ by specific test battery and specific test item, an item-by-item analysis is presented.

Cardiovascular Fitness

The best research in the area of CRH standards for children and youth is for the mile run/walk field test of cardiovascular fitness. The recent work of Cureton and Warren (1990) presents sound empirical evidence for the establishment of the Fitnessgram CRH standards. The standards are based on the adult levels of VO$_2$max consistent with good health and functioning. Run/walk standards are then adjusted for running economy and other developmental factors associated with different age and sex groups. The CRH standards for AAHPERD Physical Best were purportedly developed using the same procedures, though the information does not appear in published literature. Cureton and Warren (1990) note that the AAHPERD Physical Best standards were based on higher VO$_2$max standards to adjust for the decrease in fitness known to occur with age.

Validity (contingency) coefficients for the Fitnessgram based on successful VO$_2$max classification using run/walk scores were shown to be quite good. Of the 16 coefficients reported by Cureton and Warren (1990), 12 were .80 or higher (range .73 to 1.00). In contrast, validity coefficients for AAHPERD Physical Best standards were much lower, with only 2 of 16 coefficients higher than .80 (range .27 to .83).

Depending on age, 64.6 to 81.3% of boys (Table 3) and 49.7 to 79.2% of girls (Table 4) meet the Fitnessgram CRH standard for cardiovascular fitness. For boys, 36.5 to 57% and for girls 29.8 to 55.0% meet the AAHPERD Physical Best CRH standard. In general, the number of children and youth meeting the

Table 2. Test items and fitness component measured

Test Item	Fitness Component Measured	Unit of Measure
Pull-ups	Upper arm and shoulder girdle muscular strength and endurance	Number of pull-ups
Flexed arm hang (arm hang)	Upper arm and shoulder girdle muscular strength and endurance	Seconds
Curl-ups, 1-min-flexed leg (sit-ups)	Abdominal muscle strength and endurance	Number of sit-ups
V-tie reach (sit and reach)	Hamstring and low back flexibility	Inches beyond toes
1-mile run/walk (mile run)	Cardiorespiratory endurance	Minutes, seconds
Shuttle run	Agility; running speed and change of direction	Seconds
50-yd dash	Running speed	Seconds
Standing long jump	Lower limb explosive power	Feet, inches
2-mile walk	Cardiorespiratory endurance	Minutes, seconds

AAHPERD Physical Best CRH is similar to the number who pass when the traditional 50th percentile standard is applied.

Regardless of the standard used, too many children may be low in cardiovascular fitness. Yet many more children and youth are judged to be unfit when norm-referenced standards or the AAHPERD Physical Best standards are used than when the Fitnessgram CRH standards are used.

Flexibility

The concern that lack of flexibility in the lower back might place an individual at risk for future back problems was first suggested when the results of Kraus-Weber tests were reported in the 1950s (Kraus & Hirschland, 1954). The most often failed item in the Kraus-Weber battery was the toe touch, which 32 to 55% of American children failed. This was considered a "shocking" finding.

The Kraus-Weber flexibility item required the ability to touch the toes, a standard similar to the CRH standard used for both the Fitnessgram and AAHPERD Physical Best test batteries. It should be noted that at no age (for either sex) did as many as 55% of NSPFS subjects fail to meet the flexibility CRH standard (Note 2). Results indicate that 47.6 to 75.2% of boys and 72.5 to 92.9% of girls could reach one inch beyond

Table 3. Passing rates (%) of NSPFS male children and youth for Fitnessgram and AAHPERD Physical Best CRH standards

Age	Test	Pull-Up	Arm Hang	Mile Run	Sit-Reach	Sit-Up
6	Fitnessgram	48.5	61.6	73.7	52.0	65.8
	Physical Best	48.5	--	41.0	52.0	65.6
7	Fitnessgram	62.3	69.6	76.6	53.6	83.1
	Physical Best	62.3	--	41.1	53.6	67.0
8	Fitnessgram	64.1	52.2	75.8	47.6	75.8
	Physical Best	64.1	--	36.5	47.6	72.9
9	Fitnessgram	69.0	50.2	73.4	50.7	79.6
	Physical Best	69.0	--	41.8	50.7	63.6
10	Fitnessgram	72.6	58.4	65.3	52.4	75.7
	Physical Best	72.6	--	41.6	52.4	57.1
11	Fitnessgram	66.5	56.8	70.9	57.2	79.2
	Physical Best	54.0	--	44.2	57.2	58.1
12	Fitnessgram	71.8	59.2	69.6	51.0	73.1
	Physical Best	58.8	--	55.6	51.0	63.0
13	Fitnessgram	64.6	63.9	74.1	48.7	79.6
	Physical Best	53.6	--	46.8	48.7	63.5
14	Fitnessgram	70.5	62.2	64.6	60.3	74.1
	Physical Best	60.6	--	44.1	60.3	74.1
15	Fitnessgram	64.1	61.3	70.1	66.4	72.3
	Physical Best	64.1	--	45.7	66.4	63.9
16	Fitnessgram	71.8	57.1	74.3	73.5	71.5
	Physical Best	71.8	--	53.4	73.5	55.1
17	Fitnessgram	76.2	63.8	81.3	75.2	70.0
	Physical Best	76.2	--	57.0	75.2	51.9

Note. Shuttle run not included because no CRH standards exist for this item.

Table 4. Passing rates (%) of NSPFS female children and youth for Fitnessgram and AAHPERD Physical Best CRH standards

Age	Test	Pull-Up	Arm Hang	Mile Run	Sit-Reach	Sit-Up
6	Fitnessgram	31.5	55.7	79.2	75.1	66.5
	Physical Best	31.5	--	48.9	75.1	66.5
7	Fitnessgram	32.7	65.1	76.7	75.1	77.9
	Physical Best	32.7	--	36.0	75.1	57.1
8	Fitnessgram	39.6	52.2	71.2	74.2	68.6
	Physical Best	39.6	--	29.8	74.2	64.0
9	Fitnessgram	39.0	50.6	66.8	72.5	75.3
	Physical Best	39.0	--	35.5	72.5	64.8
10	Fitnessgram	41.8	52.7	60.9	78.4	54.9
	Physical Best	41.8	--	44.0	78.4	54.9
11	Fitnessgram	38.6	46.8	59.7	82.6	63.5
	Physical Best	38.6	--	55.0	82.6	48.0
12	Fitnessgram	34.7	47.1	63.2	84.9	73.2
	Physical Best	34.7	--	47.3	84.9	58.4
13	Fitnessgram	28.8	35.1	62.0	84.2	77.7
	Physical Best	28.8	--	48.0	84.2	66.4
14	Fitnessgram	36.8	38.8	55.7	88.5	62.8
	Physical Best	36.8	--	52.9	88.5	62.8
15	Fitnessgram	32.5	36.5	57.6	89.0	57.9
	Physical Best	32.5	--	54.8	89.0	57.9
16	Fitnessgram	32.9	37.6	49.7	92.9	53.9
	Physical Best	32.9	--	47.5	92.9	53.9
17	Fitnessgram	38.5	36.7	52.2	90.8	50.2
	Physical Best	38.5	--	49.3	90.8	50.2

Note. Shuttle run not included because no CRH standards exist for this item.

their toes. Most children and youth meet currently established CRH standards Only young NSPFS boys show relatively high failure rates.

Though many children and youth meet current flexibility standards, the validity of such tests have not been well documented. Recent research (Jackson & Baker, 1986; Jackson & Langford, 1989) has shown that the sit and reach measure is primarily an indicator of hamstring length. Relationships of the sit and reach test to back flexibility are low. The association of the sit and reach to good health (prevention of low back pain) may not be as strong as previously assumed.

Arm and Shoulder Girdle Strength and Endurance

Upper arm and shoulder girdle strength/endurance for both boys and girls has long been a fitness concern. To date, however, relationships among arm and shoulder strength test performance and poor health have not been clearly established. Therefore little, if any, evidence documents the validity of the CRH standards, which are essentially the same for the Fitnessgram and AAHPERD Physical Best batteries. For boys, 48.5 to 76.2% meet the pull-up CRH standards. For girls, 28.8 to 41.8% meet the CRH standard. For the flexed arm hang 50.2 to 69.6% of boys and 35.1 to 65.1% of girls meet the Fitnessgram CRH standard. AAHPERD Physical Best does not include the flexed arm hang among its test items, so no CRH standard is available.

Abdominal Strength/Endurance

In the area of abdominal strength and muscular endurance (sit-up test item), 65.6 to 83.1% of boys and 50.2 to 77.9% of girls achieved the Fitnessgram CRH standard. A slightly lesser passing rate was reported for AAHPERD Physical Best, 51.9 to 74.1% for boys and 48.0 to 66.5% for girls. Like arm and shoulder strength, there is little empirical evidence on which to base CRH standards for abdominal strength/endurance. Neither in the NSPFS primary report nor in any of the previous national fitness surveys has lack of abdominal strength/endurance been identified as an area of particular concern.

Passing Rates Using a Multiple Item Test Battery

The analysis of individual health-related fitness test items suggests that the majority of children and youth meet the best documented existing CRH standards for single test items with the exception of arm and shoulder girdle strength/endurance. A child or youth might, however, be fit in one area but not in another. For this reason it was deemed useful to determine how many children and youth meet CRH standards for multiple test items.

Of the three groups studied in NSPFS, only one took as many as four items currently used in a health-related battery. It was possible to identify four tests for which Fitnessgram CRH standards were available. For this reason, Group 2 was used to determine the number of children and youth who could "pass" 0, 1, 2, 3, or 4 of the test items when judged against CRH standards. Group 2 took the flexed arm hang, not the pull-up test, so similar calculations could not be made for the AAHPERD Physical Best battery.

As few as 8.2% (17-year-old girls) were able to meet the CRH standard on all four items, the lowest of any age/sex group (see Table 5). The highest percentage of students passing all four items was 30.1% among 17-year-old boys. At most ages, approximately 40% of all children and youth passed two test items or less. It was possible to determine the number of subjects in Group 2 who could pass as many as three of the items in the AAHPERD Physical Best battery (pull-up not included). As few as 11.5% (6-year-old boys) and as many as 37.2% (14-year-old girls) were able to meet the AAHPERD Physical Best standards for the three items analyzed (see Table 6). Interesting is the fact that for 11 of 12 age groups for boys, fewer subjects could pass all three AAHPERD Physical Best

Table 5. Percentage of children and youth meeting FITNESSGRAM CRH standards for multiple test items (mile run, flexed arm hang, sit and reach, sit-ups)

			Number of Test Items Passed				
Age	Sex	*N*	0	1	2	3	4
6	Boys	122	9.0	15.6	23.8	36.1	15.6
	Girls	117	1.7	11.1	25.6	36.8	24.8
7	Boys	219	2.3	11.0	27.9	41.6	17.4
	Girls	218	3.2	7.3	27.1	38.5	23.9
8	Boys	225	4.9	20.0	27.1	34.7	23.9
	Girls	220	6.8	15.9	20.0	30.9	13.3
9	Boys	236	8.9	15.3	23.7	34.7	17.4
	Girls	215	7.4	14.9	18.1	32.6	27.0
10	Boys	214	10.3	15.0	22.0	36.4	16.4
	Girls	206	12.6	16.0	24.3	28.8	18.4
11	Boys	160	3.7	15.6	21.2	35.6	23.7
	Girls	143	9.1	17.5	22.4	32.2	18.9
12	Boys	215	6.5	13.0	23.3	36.3	20.9
	Girls	217	3.7	16.6	25.3	28.6	25.8
13	Boys	311	4.5	11.9	21.5	34.4	27.7
	Girls	326	7.4	11.7	22.7	33.7	24.5
14	Boys	392	6.4	13.0	20.4	31.9	28.3
	Girls	342	5.8	17.5	26.0	25.7	24.9
15	Boys	412	4.6	12.9	23.5	35.2	23.8
	Girls	363	5.2	24.2	25.9	27.8	16.8
16	Boys	322	4.3	16.1	22.0	28.9	28.6
	Girls	248	5.6	28.2	26.6	25.8	13.7
17	Boys	186	2.2	13.4	22.6	31.7	30.1
	Girls	134	6.0	32.1	32.1	21.6	8.2

items than could pass all four Fitnessgram items. This is obviously a reflection of the more stringent standards, especially for the mile run/walk. For girls, a greater percentage were able to pass all three AAHPERD Physical Best items than could meet all four Fitnessgram in 10 of 12 age levels. The inclusion of the arm hang measure clearly resulted in a higher failure rate.

While the majority of children and youth meet CRH standards for individual test items, many do not meet current CRH standards for all items in a multiple item battery.

Question 2: Has the Fitness Level of American Children and Youth Changed Over the Years?

Are American children becoming less fit with each passing decade? This question was of primary interest to the NSPFS authors and is important to most Americans. A historical review of physical fitness surveys shows similar, not decreasing, performances from 1965 to 1975 (Hunsicker & Reiff, 1977) on most variables studied including pull-ups and sit-ups. Only between 1957 and 1965 did performance differences exist, and these were characterized by increases in test scores not decreases (Note 3).

Table 6. Percentage of children and youth meeting AAHPERD Physical Best CRH standards for multiple test items (mile run, sit and reach, sit-ups)

			Number of Test Items Passed			
Age	Sex	*N*	0	1	2	3
6	Boys	122	16.0	29.5	42.6	11.5
	Girls	117	6.0	23.1	48.7	22.2
7	Boys	219	13.7	36.1	37.4	12.8
	Girls	218	9.6	38.5	37.2	14.7
8	Boys	225	14.2	35.6	38.2	12.0
	Girls	220	10.9	33.6	37.3	18.2
9	Boys	238	20.8	31.8	31.8	15.7
	Girls	215	12.6	30.2	37.2	20.0
10	Boys	214	21.1	28.2	38.5	12.2
	Girls	206	16.5	24.8	37.9	20.9
11	Boys	160	16.2	35.0	31.9	16.9
	Girls	143	13.3	30.8	34.3	21.7
12	Boys	215	10.7	28.0	38.8	22.4
	Girls	217	10.2	28.2	31.5	30.1
13	Boys	311	13.8	27.7	36.0	22.5
	Girls	326	10.1	18.7	35.0	36.2
14	Boys	392	10.2	25.8	37.2	26.8
	Girls	342	7.0	22.6	33.1	37.2
15	Boys	412	10.0	30.7	38.3	21.0
	Girls	363	5.8	31.7	34.7	27.8
16	Boys	322	12.4	31.7	29.8	26.1
	Girls	248	8.1	37.5	30.2	24.2
17	Boys	186	8.1	32.3	33.9	25.8
	Girls	134	11.9	38.8	32.8	16.4

Using current NSPFS data, interyear comparisons (1975–85) were possible for only five fitness items: the 50-yd dash, the standing long jump, the shuttle run, the pull-up for boys, and the flexed arm hang for girl. Although the mile run was inluded in the 1975 battery, norms were adopted from a Texas sample, and no national data are available for comparison. Until the 1985 survey, pull-ups were not administered to girls nor the flexed arm hang to boys. The sit-up has been modified over the years, and the sit and reach was not tested until 1985, so comparisons were not possible for these measures. Because children under age 10 were not tested until 1985, interyear comparisons were available only for ages 10–17.

The results of the NSPFS primary analyses, which tracked fitness changes from 1975 to 1985, showed that only 5 of 32 comparisons for boys and 4 of 32 for girls were statistically significant at the .05 level. At least 3 of the 64 comparisons would be expected to differ due to chance. Of the five significant differences for boys from 1975 to 1985, four showed improvements. Improvements were in the long jump for 13- and 14-year-olds and for the shuttle run for 16- and 17-year-olds. Only 11-year-old boys in the 50-yd dash showed a performance decrease from 1975 to 1985. The four significant differences for girls from 1975 to 1985 all showed decreases in performance on the 50-yd dash. At ages 10, 11, 14, and 16, girls ran the dash slower in 1985 than in 1975. Note that effect sizes for the nine significant differences were small (Thomas, Salazar, & Landers, 1991), ranging from .06 to .22. This further reinforces the notion that fitness performances did not change from 1975 to 1985.

All of the nine significant year-to-year differences were on items considered to be measures of athletic or skill-related fitness rather than health-related fitness. Of the three test items for which significant differences were found, two are no longer included in any of the three major fitness batteries (50-yd dash and standing long jump). The shuttle run is still included in the PCPFS battery, and improvements, not decreases, in performance occurred for this item.

The two health-related test items for which there are data for as many as three decades are the pull-up for boys and the flexed arm hang for girls, ages 10 to 17. As previously noted, there were no significant performance differences for these measures at any age between 1975 and 1985. Raw data were not available to make comparisons for more than one decade; however, norm tables are available for use in making crude comparisons.

In Table 7, the CRH standards for pull-ups (boys) for each age ranging from 10 to 17 are presented. The percentage of youth achieving the CRH standard are presented for each decade. For example, 10-year-olds must do one pull-up to meet the CRH standard. Fifty-five percent could meet the CRH standard in 1958, 65% in 1975, and 72.6% in 1985. Because tables from each report are available only in five percentile units, they can only be reported in increments of five. More exact percentile scores for 1985 are presented because raw data were available for making such calculations. These data show no trend toward decreased performance over the decades. In fact, it could be argued that performance in 1985 is superior to that in 1958.

Table 7 also shows the interdecade comparisons for 10- to 17-year-old girls for the flexed arm hang. As was the case with the pull-up for boys, no decrease in scores occurred from 1965 to 1985.

Although previous NSPFS studies are not available for comparing flexibility scores, the 1985 passing rates can be compared with the Kraus-Hirschland data of 1954. More NSPFS children and youth were able to touch their toes in 1985 than in the 1950s. Even though some testing differences exist, this seems to refute the concern that children have grown less flexible over the last three decades.

Table 7. Interdecade performance (percentage of students meeting the Fitnessgram CRH standard) for the pull-up test (boys) and flexed arm hang (girls)

Pull-ups

Age	CRH Standard	1958	1965	1975	1985
10	1	55	70	65	72.6
11	1	60	70	70	66.5
12	1	70	70	65	71.8
13	2	60	65	65	64.6
14	3	50	70	65	70.5
15	5	40	60	60	64.1
16	5	55	65	70	71.8
17	5	60	70	70	76.2

Flexed Arm Hang

Age	CRH Standard	1958	1965	1975	1985
10	8	NA	50	50	52.7
11	8	NA	50	55	46.8
12	8	NA	40	55	47.1
13	12	NA	30	30	35.1
14	12	NA	30	35	38.8
15	12	NA	35	40	36.5
16	12	NA	30	30	37.6
17	12	NA	30	35	36.7

Note. NA = Not available.

Other studies (Gortmaker, Deitz, Sobol, & Wehler, 1987; Ross, Pate, Lohman, & Christenson, 1987) have shown body fatness to be one variable on which children and youth have shown poorer scores over the last 20 years. Skinfold measures were not included in the NSPFS survey, nor have they been included in any of the previous AAHPER(D) surveys, so comparisons were not possible in this study.

Fatness as assessed by skinfolds is a test item for which a reasonably sound basis for establishing CRH standards has been established. Recent research (Williams et al., 1992) has established that children and youth who fail to meet CRH skinfold standards in the Fitnessgram battery are more likely to have elevated blood pressure and total cholesterol levels.

Discussion

In this secondary analysis of NSPFS data, health-related criterion-referenced standards were used to assess the fitness of American children and youth. There is some concern about using this approach because standards based on sound research are only available for cardiovascular fitness (Cureton & Warren, 1990) and body composition (Williams et al., 1992). For flexibility, muscular strength, and endurance, the standards are much more arbitrary. A standard for flexibility based on the research of Kraus and Hirschland (1954) has gained some support among fitness experts; however, recent research (Jackson & Baker, 1986; Jackson & Langford, 1989) questions the value of the sit and reach as a health-related test. Abdominal strength/endurance is deemed important for good posture and care of the back, but the criterion level for sit-up performance necessary to produce health benefits has yet to be established. Similarly, performance on the pull-up or flexed arm hang tests has not been shown to relate directly to optimal health.

Nevertheless, the use of CRH standards to view the fitness of American children and youth provides some advantages over norm-referenced standards. This is especially true given the NSPFS acknowledgment of the importance of health and fitness throughout life when assessing child and youth fitness. The following discussion interprets NSPFS results using CRH standards.

Current Fitness Levels of Children and Youth

Even when considering limitations of CRH standards (Cureton & Warren, 1990) for assessing the fitness of American children and youth, this approach provides a view previously not available in the original NSPFS report. It is worthy to note that as few as 20 to 30% of children fail to meet the Fitnessgram CRH standard for cardiovascular fitness (Note 4), the most documented standard studied here. Other studies (Blair, Clark, Cureton, & Powell, 1989; Looney & Plowman, 1990) using different data bases reported similar success rates. Looney and Plowman reported success rates for the Fitnessgram body fatness standards (skinfold) of 80% or greater and 85% or greater for flexibility (sit and reach). NSPFS data were not available for skinfolds, but sit and reach performance on the apparently more difficult V-sit test yielded passing rates of only 50 to 75%.

The stringency of a given standard has much to do with interpretations concerning the fitness of American children and youth. It could be argued that the use of documented CRH standards described in the previous paragraph results in false mastery. That is, youth will think that they are fit when they may not be. As Cureton and Warren (1990) note, this could result in a decrease in exercise and future fitness erosion. On the other hand, the use of undocumented normative and/or CRH standards can result in false failure. Children and youth can be judged unfit when they are really fit. This could lead to discouragement if the goal is perceived as unattainable (Corbin, Lovejoy, Steingard, & Emerson, 1990). Research (Whitehead & Corbin, 1991) suggests that intrinsic motivation and feelings of competence of youth suffer when success feedback is absent as is the case when false failure occurs. Teacher reports of low motivation associated with failure, and the high rate of failure using traditional normative standards has been documented (Corbin et al., 1990). While continued research is necessary to better understand the fitness of children and youth, the best information available at present should be considered when setting standards. It is our judgment that the standards for cardiovascular fitness and body fatness (that demonstrate 70 to 80% pass rates) are the most defensible standards currently available and the risk of false mastery associated with these standards outweighs the risk of false failure associated with more stringent and less documented standards.

Another consideration with regard to single items is the relatively high failure rates for the pull-up and flexed arm hang. Is it reasonable to believe that 30 to 50% of boys and 60 to 70% of girls lack adequate arm and shoulder girdle strength/endurance as pull-up results imply? Is it reasonable to believe that 30 to 50% of boys and 50 to 65% of girls lack adequate arm and shoulder girdle strength/endurance as the flexed arm hang test results imply? Why would it be expected that failure rates for these items would be two to three times higher than for other test items? This high rate of failure may occur because norm-referenced standards were used in the absence of empirical evidence. The one pull-up CRH standard for girls is no doubt a result of the fact that it was the lowest measurable number. Additional relevant questions should be asked. Is one pull-up a meaningful criterion of health for girls? Could girls meet the one pull-up standard after a period of regular reasonable exercise? Is the risk of false failure high? Similar questions could be asked about the pull-up item for boys and the flexed arm hang test item for boys and girls.

On the one hand, based on data from this study, it may be that children and youth are especially lacking in arm and shoulder girdle strength/endurance and more intensive efforts should be made to improve this fitness component. This is the traditional viewpoint and is exemplified by the primary study's conclusion that "upper arm and shoulder girdle strength/endurance for both men and women has previously been identified as a major physical weakness for those who served in two world wars; the improvement of this component still waits to be addressed" (Reiff et al., 1986, p. 46). Alternative wisdom suggests that standards using data-based "cut-off" scores should be developed (see Looney & Plowman, 1990) if the pull-up and flexed arm hang are to be used in future tests. In the meantime, if CRH standards are to be derived using normative data, the standards for passing should be more nearly aligned with test items that have well-documented standards (70 to 80%) rather than being set at current levels (40 to 70%). Also, because of its lack of ability to discriminate at the low end, especially for girls, the adequacy of the pull-up as a test item should be questioned.

Like the pull-up and flexed arm hang, convincing evidence is not available to indicate that abdominal and hip flexor muscle strength/endurance is especially likely to be low among children and youth. If the sit-up item is to be used in the future, adjustments of standards for this item should be considered. A suggestion might be to set standards that allow a 70 to 80% success rate, as is true of the Fitnessgram standards for boys, rather than the Fitnessgram and AAHPERD Physical Best standards for girls, which only allow a 50 to 60% success rate.

Another concern is that too few children and youth meet CRH standards on a battery of test items. Inclusion of a body composition measure would, no doubt, have increased the number of children and youth who failed to meet all CRH standards. If high failure rates on individual test items send a message of failure to children, the need to pass a battery of test items accentuates this message. A child could achieve mastery on three or four items and perceive her/himself as a failure if failing one item is deemed the criterion for test failure. Success on the Kraus-Weber test administered in the early 1950s was based on success on all test items. Even though individual item standards were low, failure of one item resulted in failure for the entire test. The original research showed that 57.9% of American children and youth failed one item. Thus a single item resulted in failure by large numbers of children. Results of this secondary analysis show that few children and youth, less than 50%, meet all of the existing CRH standards for either of the batteries studied.

Modifying standards or test items as previously described would decrease the failure rates for total test batteries; however, it would not eliminate the problem. Given the previously presented rationale for fostering success, we encourage the use of individual test item feedback. Specifically, rather than communicating total test failure for failure on one test item, positive feedback should be given to students who successfully pass individual item standards and encouragement offered to motivate students to pass those items for which standards have not been met. While the goal should be to help children and youth meet all sound CRH standards, it is our judgment that the fitness of American youth should not be judged solely by the percentage who meet all standards of a multiple test battery.

Long-Term Changes in Child and Youth Fitness

The NSPFS study (Reiff et al., 1986) expressed concern that the fitness of youth over time had decreased. However, this study shows little, if any, evidence that indicates that children and youth are less fit than they were in previous decades. In addition, because few health-related fitness variables have been studied over time, it is difficult to arrive at such a conclusion with any degree of confidence. The only health-related measures studied over a number of decades (pull-ups and flexed arm hang) show no decrease in test scores. There is much more data related to skill and/or athletic-related fitness than health-related fitness.

The one test item for which evidence exists that changes in fitness have occurred over time is body fatness (Gortmaker et al., 1987; Ross et al., 1987), a variable not included in NSPFS. Of special concern is that this increase may not be spread across all groups of children. It appears that youth who are lean are getting leaner or staying lean whereas those who are fat seem to grow fatter as they get older (Garn & LaVelle, 1985). There is strong concern that the same pattern is emerging with other physical fitness components. In fact, recent research (Dennison, Straus, Mellits, & Charney, 1988) supports this contention and illustrates the need to provide special help for low-fit children.

Conclusion

Those conducting the fitness survey in the 1960s concluded that the results of the first testing in 1957 showed that young people in America were not as physically fit and vigorous as they should be (AAHPER, 1965). This conclusion has been repeated throughout subsequent survey reports and apparently is the basis for the conclusion that children and youth are "still" unfit as reported in the current NSPFS report (Reiff et al., 1986).

Although we support the NSPFS report contention that children have a low level of physical fitness in important components of physical fitness, we think that far fewer children are lacking in fitness than previous reports have implied. Evidence indicates that, for health's sake, low fitness levels should be avoided (Blair, Kohl et al., 1989; Williams et al., 1992), but there is little evidence that exceptionally high levels of fitness are necessary for good health. The attainment of minimal CRH standards on all tests seems difficult enough for most children and youth without imposing exceptionally high standards that most children and youth may find impossible to achieve (Bouchard, 1990; Bouchard, Shephard, Stephens, Sutton, & McPherson, 1990; Krahenbuhl, Skinner, & Kohrt, 1985).

We urge a focus on efforts to help all children and youth meet reasonable and relevant physical fitness standards. However, it is shortsighted to focus only on physical fitness levels. Of equal if not greater importance is the need to encourage and monitor regular physical activity. Hopefully, more reasonable and relevant standards will help children attain a lifetime of physical activity.

References

AAHPER. (1958). *AAHPER youth fitness test manual*. Washington, DC: American Association for Health, Physical Education and Recreation.

AAHPER. (1965). *AAHPER youth fitness test manual*. Washington, DC: American Association for Health, Physical Education and Recreation.

AAHPERD. (1976). *AAHPERD youth fitness test manual*. Reston, VA: American Alliance for Health, Physical Education, Recreation and Dance.

AAHPERD. (1980). *AAHPERD health-related fitness test manual.* Reston, VA: American Alliance for Health, Physical Education, Recreation and Dance.

AAHPERD. (1988). *Physical Best test manual.* Reston, VA: American Alliance for Health, Physical Education, Recreation and Dance.

American College of Sports Medicine, (1988). American College of Sports Medicine: Opinion statement on physical fitness in children and youth. *Medicine and Science in Sports and Exercise*, 20, 422-423.

American Academy of Physical Education. (1987). Resolutions on youth fitness. *The AAPE News*, 8, 1-2.

Blair, S.N., Clark, D.G., Cureton, K.J., & Powell, K.J. (1989). Exercise and fitness in childhood: Implications for a lifetime of health. In C.V. Gisofli & D.V. Lamb (Eds.), *Perspectives in exercise science and sports medicine: Youth, exercise, and sport* (pp. 401-430). Indianapolis: Benchmark Press.

Blair, S.N., Kohl, H.W., Paffenbarger, R.S., Clark, D.G., Cooper, K.H., & Gibbons, L.W. (1989). Physical fitness and all-cause mortality: A prospective study of healthy men and women. *Journal of the American Medical Association*, 17, 2395-2401.

Bouchard, C. (1990). Discussion: Heredity, fitness and health. In C. Bouchard, R.J. Shephard, T. Stephens, J.R. Sutton, & B.D. McPherson (Eds.), *Exercise, fitness and health* (pp. 147-153). Champaign, IL: Human Kinetics.

Bouchard, C., Shephard, R.J., Stephens, T., Sutton, J.R., & McPherson, B.D. (Eds.). (1990). The consensus statement. In C. Bouchard, R.J. Shephard, T. Stephens, J.R. Sutton, & B.D. McPherson (Eds.), *Exercise, fitness and health* (pp. 3-28). Champaign, IL: Human Kinetics.

Boyle, R.H. (1955, August 15). The report that shocked the President. *Sports Illustrated*, pp. 30-33+.

Caspersen, C.J., Powell, K.E., & Christenson, G.M. (1985). Physical activity, exercise and physical fitness: Definitions and distinctions for health-related research. *Public Health Reports*, 100, 126-131.

Corbin, C.B., Dowell, L.J., Lindsey, R., & Tolson, H. (1970). *Concepts of physical education.* Dubuque, IA: Wm. C. Brown.

Corbin, C.B., Lovejoy, P.Y., Steingard, P., & Emerson, R. (1990). Fitness awards: Do they accomplish their intended objecives? *American Journal of Health Promotion*, 4, 345-351.

Cureton, K.J., & Warren, B.L. (1990). Criterion-referenced standards for youth health-related fitness tests: A tutorial. *Research Quarterly for Exercise and Sport*, 61, 7-19.

Dennison, B.A., Straus, J.H., Mellits, E.D., & Charney, E. (1988). Childhood physical education tests: Predictor of adult physical activity levels? *Pediatrics*, 82, 324-330.

Garn, S.M., & LaVelle, M. (1985). Two-decade follow-up of fatness in early childhood. *American Journal of Diseases in Childhood*, 139, 181-185.

Gortmaker, S.L., Dietz, W.H., Sobol, A.N., & Wehler, C.A. (1987). Increasing pediatric obesity in the U.S. *American Journal of Diseases in Children*, 14, 535-540.

Hunsicker, P.A., & Reiff, G.G. (1977). Youth fitess report: 1958-1965-1975. *Journal of Health, Physical Education and Recreation*, 48(1), 31-33.

Institute for Aerobics Research. (1987). *Fitnessgram user's manual.* Dallas: Institute for Aerobics Research.

Jackson, A.W., & Baker, A.A. (1986). The relationships of the sit and reach test to criterion measures of hamstring and back flexibility in young females. *Research Quarterly for Exercise and Sport*, 57, 183-186.

Jackson, A.W., & Langford, N.J. (1989). The criterion-related validity of the sit and reach test: Replication and extension of previous findings. *Research Quarterly for Exercise and Sport*, 60, 384-387.

Johnson, P.B., Updyke, W.F., Stolberg, D.C., & Schaefer, M. (1966). *Physical education: A problem solving approach to health and fitness.* New York: Holt, Rinehart, and Winston.

Kirschner, G., & Glines, D. (1957). Comparative analysis of Eugene, Oregon elementary school children using the Kraus-Weber test of minimum muscular fitness. *Research Quarterly*, 28, 16-25.

Krahenbuhl, G.S., Skinner, J.S., & Kohrt, W.M. (1985). Developmental aspects of maximal aerobic power in children. *Exercise and Sports Science Reviews*, 12, 503-538.

Kraus, H., & Hirschland, R.P. (1954). Minimum muscular fitness tests in school children. *Research Quarterly*, 25, 178-188.

Looney, M.A., & Plowman, S.A. (1990). Passing rates of American children and youth on the Fitnessgram Criterion-referenced Physical Fitness Standards. *Research Quarterly for Exercise and Sport*, 61, 215-223.

Noguchi, Y. (1956). Fitness testing of Japanese children. *Journal of Health, Physical Education and Recreation*, 27(8), 20-23.

Pate, R. R. (1983). A new definition of youth fitness. *The Physician and Sportsmedicine*, 11(4), 77-83.

Pate, R.R. (1988). The evolving definition of physical fitness. *Quest*, 40, 174-179.

Phillips, M. (1955). Analysis of results from the Kraus-Weber Test of minimum muscular fitness of chidren. *Research Quarterly*, 26, 314-315.

Reiff, G., Dixon, W., Jacoby, D., Ye, G., Spain, C., & Hunsicker, P. (1986). *The President's Council on Physical Fitness and Sports National School Population Fitness Survey.* Ann Arbor, MI: University of Michigan.

Ross, J.G., Pate, R.R., Lohman, T.G., & Christenson, G.M. (1987). Changes in body composition of children. *Journal of Physical Eduction, Recreation and Dance*, 58(0), 74-77.

Sallis, J.F., & McKenzie, T.L. (1991). Physical education's role in public health. *Research Quarterly for Exercise and Sport*, 62, 124-137.

Simons-Morton, B.G., O'Hara, N.M., Simons-Morton, D., & Parcel, G.S. (1987). Children and fitness: A public health perspective. *Research Quarterly for Exercise and Sport*, 58, 295-302.

Simons-Morton, B.G., Parcel, G.S., O'Hara, N.M., Blair, S.N., & Pate, R.R. (1988). Health-related physical fitness in childhood: Status and recommendations. *American Review of Public Health*, 9, 403-425.

Thomas, J.R., Salazar, W., & Landers, D.M. (1991). What is missing in p < .05? Effect size. *Research Quarterly for Exercise and Sport*, 62, 344-348.

U.S. Department of Health and Human Services. (1987). *The Presidential Physical Fitness Awards Program: Instructor's guide*. Washington, DC: Author.

Whitehead, J.R., & Corbin, C.B. (1991). Youth fitness testing: The effect of percentile-based evaluative feedback on intrinsic motivation. *Research Quarterly for Exercise and Sport*, 62, 225-231.

Williams, D.P., Going, S.B., Lohman, T.G., Harsha, D.W., Srinivasan, S.R., Webber, L.S., & Berenson, G.S. (1992). Body fatness and the risk for elevated blood pressure, total cholesterol and serum lipoprotein ratios in children and adolescents. *American Journal of Public Health*, 82, 358-363.

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Notes

1. The American Alliance for Health, Physical Education, Recreation and Dance was formerly the American Association for Health, Physical Education and Recreation.

2. The test for which CRH standards were developed is done with the feet together and uses a flexibility box so that the hands are elevated from the floor at the point of measurement. In the NSPFS test the measurement is made at floor level using a mark between spread feet. The Kraus-Weber test required the subject to touch the toes from a standing position. These varying procedures may account for differences in test performances.

3. An alternate explanation of the fitness score improvements from 1957 to 1965 is test experience. In 1957, few children had experienced fitness testing. By 1965, children were accustomed to being tested. Skill at test taking could be a reason for the difference in scores from 1957 to 1965.

4. The Fitnessgram CRH standard was selected by the authors for making comparisons of cardiovascular fitness because it is based on empirical evidence reported in published literature.

The Reliability of Distance Run Tests for Children in Grades K–4

Roberta E. Rikli, Clayre Petray, and Ted A. Baumgartner

The purpose of this study was to determine test-retest reliability for the 1-mile, 3/4-mile, and 1/2-mile distance run/walk tests for children in Grades K–4. Fifty-one intact physical education classes were randomly assigned to one of the three distance run conditions. A total of 1,229 (621 boys, 608 girls) completed the test-retests in the fall (October), with 1,050 of these students (543 boys, 507 girls) repeating the tests in the spring (May). Results indicated that the 1-mile run/walk distance, as recommended for young children in most national test batteries, has acceptable intraclass reliability (.83 < R < .90) for both boys and girls in Grades 3 and 4, has minimal (fall) to acceptable (spring) reliability for Grade 2 students (.70 < R < .83), but is not reliable for children in Grades K and 1 (.34 < R < .56). The 1/2 mile was the only distance meeting minimal reliability standards for boys and girls in Grades K and 1 (.73 < R < .82). Results also indicated that reliability estimates remained fairly stable across gender and age groups from the fall to spring testing periods, with the exception of the noticeably improved values for Grade 2 students on the 1-mile run/walk test. Criterion-referenced reliability (P, percent agreement) was also estimated relative to Physical Best and Fitnessgram run/walk standards. Reliability coefficients for all age group standards were acceptable to high (.70 < P < .95), except for Fitnessgram standards for 5-year-old girls on the 1-mile test for both fall and spring and for 6-year-old boys and girls on the 1-mile test administered in the spring.

Increased evidence that physical activity level is related to life-long health and well-being (Blair, Clark, Cureton, & Powell, 1989; Karvonen, 1982; Paffenbarger, Hyde, Wing, & Hsieh, 1986; Powell, Thompson, Caspersen, & Kendrick, 1987) has been accompanied by an increased interest in health-related fitness education and assessment in the schools (Pate, 1989; Whitehead, Pemberton, & Corbin, 1990). Concomitantly, indications that habits established early in childhood may relate to adult health and fitness (Blair, Clark et al., 1989; Dennison, Straus, Mellits, & Charney, 1988) have led to a nationwide interest in exercise and fitness assessment in children of increasingly younger ages. Both the AAHPERD Physical Best (McSwegin, Pemberton, Petray, & Going, 1988) and the Fitnessgram (Institute for Aerobics Research, 1987) national test batteries are designed to be administered to children beginning in kindergarten. The Chrysler Fund-AAU Fitness Test (1987) and the President's Challenge (PCPFS, 1987) advocate testing of children starting at age 6. Although the majority of fitness assessment batteries now include Grades kindergarten through 4 (K-4), there is little scientific evidence to substantiate the practicality, reliability, or validity of the various test items for children in these early grades.

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As test batteries have been developed and revised in recent years, test items considered appropriate and valid for students in Grades 5–12 have been recommended for younger children without additional supportive research. For example, the 1-mile run/walk, the most commonly prescribed distance for assessing aerobic endurance of students in Grades 5–12, is now included as the recommended distance for students in Grades K–4 in three major test batteries—Physical Best, Fitnessgram, and President's Challenge. However, it should not be assumed that items that are valid at one age level are also valid at other levels. In fact, Safrit (1990b), in a recent review of distance run tests, concluded that run/walk test validity should not be generalized across age groups or gender. In the only published study found investigating reliability of the 1/mile run/walk for young children (Krahenbuhl, Pangrazi, Petersen, Burkett, & Schneider, 1978), reliability was .82 for 34 first-grade girls and .92 for 49 third-grade boys. The researchers did not, however, indicate the statistical method used for computing reliability, nor did they describe the conditions under which the reliability testing was conducted.

In the National Children and Youth Fitness Study (NCYFS) II, the 1/2-mile run/walk was administered to children from 6 to 7 years of age, and the 1-mile run/walk administered to students aged 8 to 10 years (Ross, Delpy, Christenson, Gold, & Damberg, 1987). The reduced distance was selected for administration to the younger children based on the recommendations of a panel of experts who stressed that most children under the age of 8 have relatively short attention spans and have not been trained to run the mile distance. The panel's recommendation was also based on the premise that if participation in fitness tests is intended to serve an educational purpose, a 1/2 mile distance on a run/walk would be sufficient to introduce children to the experience of paced, long-distance running. The authors did not state whether, when making the recommendation, the panel considered the issue of the reliability and validity of the distance runs for specific age groups.

Although considerable time and money have been devoted to the development, revision, and promotion of the majority of current national fitness programs, insufficient statistical evidence exists supporting the quality of most test items across the various age groups. According to the Standards for Educational and Psychological Testing (American Psychological Association, 1985), all tests should meet, at a minimum, specific primary standards—standards essential to assessing the technical adequacy of a test. Reliability is considered an essential characteristic with respect to evaluation of test quality.

The primary purpose of this study was to conduct norm-referenced, test-retest reliability studies in Grades K–4 on the 1-mile run/walk test as recommended in most of the current national test batteries, as well as on possible alternative distances of 1/2 mile and 3/4 mile. The 1/2-mile and 3/4-mile run/walk distances are described as alternative tests in the AAHPERD Physical Best and President's Challenge programs and are included as prescribed distances in the Chrysler-AAU Physical Fitness Test. However, no research exists concerning the reliability of these distances with young children. A second purpose of the study was to calculate criterion-referenced reliability estimates relative to standards published in the Physical Best and Fitnessgram test manuals. Criterion-referenced reliability, defined as consistency of classification, refers in this study to the consistency with which test-retest scores either meet or do not meet the designated performance standard. Criterion-referenced reliability is an important test characteristic whenever test scores are interpreted in comparison to a criterion-referenced standard.

Method

Subjects

Students, Grades K–4, from eight different elementary schools in an ethnically mixed (white = 26%, Hispanic = 29%, Asian = 30%, other = 15%) school district in southern California served as subjects. Permission to conduct the study was obtained from the school district, the University Human Subjects Committee, and from the principals of the eight schools. Because the testing was conducted as part of the regularly scheduled physical education classes, student and parental permission for student participation was not required.

Fifty-one intact physical education classes were randomly assigned to a 1-mile, 3/4-mile, or 1/2-mile run/walk distance run condition. A total of 1,229 students (621 boys, 608 girls), representing 30 different distance/grade level/gender groups, completed a test-retest (1 week apart) in the fall (October). In addition, 1,050 of the students (543 boys, 507 girls), representing the same 30 distance/grade/gender combinations, completed a test-retest (1 week apart) in the spring (May). Of the 1,229 students tested in the fall, 179 were not retested in the spring owing to illness, injury, absence, or discontinued enrollment in the school.

Procedures

All physical education classes included in the study were taught by physical education specialists (teachers with a college degree in physical education) 1 day per week (30-min class periods) and by classroom teachers on 2 additional days per week. The physical education specialists took responsibility for conducting all testing in this study. Two meetings were conducted with the specialists prior to the fall testing to plan and standardize test administration and scoring procedures. Each specialist was involved in the administration of each of the three running distances at each of the five grade levels.

Prior to the testing, all subjects received similar instruction on the purpose and goals of fitness assessment. Each classroom participated in a practice trial of its specified distance 1 week before the test-retest was administered. The practice trial was supervised by the classroom teacher.

All test-retests were administered 1 week apart. The fall tests were conducted during October, allowing for approximately 1 month of physical education instruction, activity, and aerobic training prior to the testing.

The spring test-retests were conducted near the end of the school year in May. In addition to fall testing, spring testing was conducted to determine what, if any, effect increased maturity or increased experience with distance running on the part of the students would have on test reliability. Fitness tests in the schools are commonly administered at one or both of these time periods, early in the year (fall) as a pretest and/or late in the year (spring) as a posttest.

The physical education specialist administered each distance run with assistance from the classroom teacher. At each of the eight schools, distance runs were administered on a 220-yard oval outdoor track (on grass) marked with traffic cones. All students in each class ran at the same time. Sixth grade student assistants placed a mark on back of the runner's hand as each lap was completed. When the runner completed the final lap, the time was recorded to the nearest second by the classroom teacher. All students were encouraged to do their best prior to each run and were praised for their efforts following the runs. The average number of students per class in this study was 27.2, with a range of 20–34.

An average of one 30-min class period per week, taught by the physical education specialist, was devoted to aerobic activities (running, rope jumping, fitness routines, aerobic games, etc.) throughout the school year. Additionally, the specialists encouraged students to participate in aerobic activity on 2 additional days per week outside of class. To supplement the quantitative data collected, the seven specialists in the study completed an open-ended questionnaire relative to two major points: (1) their subjective judgments, based on their own experiences, concerning the most practical, realistic, and reliable run/walk distances for each grade level, and (b) their assessment of the value of fitness testing within the K–4 age groups.

Data Analysis

Norm-referenced (raw score) reliabiity measures were estimated by calculating the intraclass correlational coefficient (*R*), using a one-way ANOVA model with the formula appropriate for establishing the reliability of scores collected on one day—$(MS_b - MS_w)/(MS_b + MS_w)$ (Baumgartner & Jackson, 1991, p. 140). The one-way ANOVA model treats all sources of measurement variation, including changes in day to day performance, as error (lack of reliability), resulting in the most realistic reliability estimate for physical performance tests of this type. Criterion-referenced reliability was estimated by determining the percent of agreement (*P*) relative to classification categories indicated in a contingency table (Safrit, 1990a). *P* represents the proportion of scores classified as meeting the criterion standard on both the test and retest and the proportion of scores classified as not meeting the standard on both tests.

Results

Norm-Referenced Reliability

The reliability estimates for the fall test-retest scores of all comparison groups are presented in Table 1, with all group means and standard deviations reported in Table 2. Results indicate that the 1-mile run/walk distance, the most commonly recommended distance for young children in current test batteries, has acceptable reliability for both boys and girls in Grades 3 and 4 ($.84 < R < .90$), minimal reliability for 2nd graders (boys = .70; girls = .71), but is unreliable for students in Grades K and 1 ($.39 < R < .56$). Reliability coefficients below .70 are generally considered unacceptable (Safrit, 1990a).

In Grades K and 1, the only distance meeting minimal reliability standards is the 1/2-mile run/walk for both boys and girls, with estimates ranging from .73 to .77. For 2nd graders, no clear pattern exists as to the most reliable running distance. The 3/4-mile run/walk was the most reliable distance for boys (R = .83), followed by the 1/2-mile (R = .75) and the 1 mile

(*R* = .70). For girls, the 1/2-mile run'walk distance was the most reliable (*R* = .76), followed by the 1-mile (*R* = .71) and the 3/4-mile (*R* = .68).

The observation that children in Grade K scored better than those in Grade 1, primarily on the 1-mile test (Table 2), has no obvious explanation. However, because of the small sample sizes and the low reliability scores for these age/distance groups (Table 1), such findings should not be considered too meaningful. Sample sizes for Grades K and 1 on the 1-mile test were less than for other groups because of the larger number of students in these age groups who were unable or unwilling to complete this distance.

The end of the school year (spring) test-retest reliability estimates for all comparison groups are presented in Table 3, with means and standard deviations reported in Table 4. Results indicated that the 1-mile distance has acceptable reliability for both boys and girls in Grades 2, 3, and 4 (.82 < *R* < .87) but remains unreliable for students in Grades K and 1 (.34 < *R* < .54). In Grades K and 1, the only distance meeting minimal reliability standards is the 1/2 mile for both boys and girls, with estimates ranging from .73 to .82.

As can be seen by comparing Table 1 and 3, there was no particular tendency for reliability estimates to be either higher or lower in the spring than in the fall. The spring values were somewhat lower than in the fall in exactly 50% (15 of 30) of the comparison groups, were higher in 14 of the 30 groups, and remained unchanged in one group. The median of the 30 fall reliability estimates was .74, and the spring median reliability was .73. Most of the changes in reliability estimates from fall to spring were less than .10.

The subjective feedback (via the questionnaire) from the teachers involved in this study, most of whom have had several years experience with fitness testing of students in Grades K–4, partially supported the reliability results. There was unanimous agreement that the 1/2-mile run/walk distance is preferable for children in Grades K and 1. Teachers indicated that this distance was more pleasant and comfortable than the other distances for the students and that they were able to maintain their motivation for 1/2 mile much better than in the longer tests.

In addition, students could better relate to the concept of pacing at this distance. Instructors opinions were varied regarding the most appropriate distances for the other grade levels, although there was consensus that by 2nd grade most students were ready to try distances longer than 1/2 mile.

Table 1. Fall intraclass reliability estimates (*R*)ᵃ for the ½-mile, ¾-mile, and 1-mile distance run

		Grade level				
		K	1	2	3	4
Dist.	Gender	*R* (*n*)	*R* (*n*)	*R* (*n*)	*R* (*n*)	*R* (*n*)
½ Mile	M	.77 (39)	.74 (56)	.75 (47)	.74 (39)	.79 (37)
	F	.73 (34)	.77 (61)	.76 (46)	.67 (36)	.47 (31)
¾ Mile	M	.48 (39)	.54 (39)	.83 (44)	.89 (56)	.85 (46)
	F	.58 (32)	.64 (40)	.68 (44)	.83 (50)	.80 (47)
1 Mile	M	.53 (20)	.56 (15)	.70 (45)	.84 (53)	.67 (44)
	F	.39 (16)	.54 (17)	.71 (52)	.90 (63)	.85 (37)

Note. Dist. = distance.
ᵃ*R* values represent the reliability of a single trial.

Table 2. Means and standard deviations (in parentheses) for fall test–retest scores

		Run/Walk Distance					
		½ Mile		¾ Mile		1 Mile	
Grade	Gender	Test	Retest	Test	Retest	Test	Retest
K	M	6.47 (1.29)	6.49 (1.42)	10.76 (2.16)	10.99 (2.05)	14.53 (2.11)	14.60 (3.10)
	F	6.64 (1.22)	7.01 (1.49)	10.47 (2.25)	11.69 (2.57)	14.99 (2.26)	14.40 (3.08)
1	M	6.32 (1.06)	6.54 (1.26)	9.84 (2.15)	9.61 (1.68)	15.56 (2.27)	15.45 (2.75)
	F	6.94 (1.32)	7.08 (1.17)	11.09 (2.19)	10.57 (1.67)	15.96 (2.12)	17.35 (3.33)
2	M	5.94 (1.18)	5.89 (1.69)	9.02 (2.16)	9.17 (2.32)	14.12 (2.67)	14.52 (2.89)
	F	6.53 (1.46)	6.53 (1.25)	10.01 (2.13)	9.87 (2.12)	14.35 (2.82)	14.67 (2.78)
3	M	5.90 (1.29)	6.01 (1.21)	9.24 (2.42)	9.43 (2.50)	13.75 (3.04)	13.74 (2.93)
	F	6.14 (0.86)	6.10 (0.86)	9.02 (1.76)	9.60 (1.91)	14.22 (3.10)	14.27 (3.23)
4	M	5.58 (1.24)	5.55 (1.12)	9.00 (1.76)	9.24 (2.28)	13.32 (3.45)	13.39 (3.33)
	F	6.07 (0.87)	5.85 (0.64)	10.48 (1.71)	10.43 (2.06)	13.95 (2.86)	14.09 (3.09)

Note. Times are reported in minutes and hundredths (not in minutes and seconds, as for fitness test standards in Table 5). Group *n*s are reported in Table 1. Grades K–4 correspond to mid-year (December) mean ages of 5–9, respectively.

Table 3. Spring intraclass reliability estimates (*R*)[a] for the ½-Mile, ¾-mile, and 1-mile distance run

		Grade level				
		K	1	2	3	4
Dist.	Gender	*R* (*n*)	*R* (*n*)	*R* (*n*)	*R* (*n*)	*R* (*n*)
½ Mile	M	.82 (36)	.75 (54)	.65 (42)	.76 (30)	.70 (30)
	F	.74 (27)	.73 (53)	.72 (43)	.68 (31)	.32 (20)
¾ Mile	M	.58 (36)	.68 (39)	.77 (36)	.94 (55)	.70 (33)
	F	.63 (25)	.73 (37)	.79 (38)	.73 (46)	.80 (35)
1 Mile	M	.44 (13)	.54 (11)	.82 (39)	.87 (49)	.83 (40)
	F	.34 (12)	.46 (11)	.83 (47)	.87 (52)	.83 (30)

Note. Dist = distance.

[a] *R* values represent the reliability of a single trial.

Table 4. Means and standard deviations (in parentheses) for spring test-retest scores

		Run/Walk Distance					
		½ Mile		¾ Mile		1 Mile	
Grade	Gender	Test	Retest	Test	Retest	Test	Retest
K	M	6.21 (1.15)	6.22 (1.29)	10.50 (2.52)	11.31 (2.68)	14.70 (1.94)	15.05 (2.76)
	F	6.49 (0.73)	6.72 (1.27)	10.66 (2.47)	11.35 (2.42)	15.39 (1.92)	16.95 (2.52)
1	M	5.73 (0.83)	5.93 (0.95)	9.00 (1.60)	9.47 (2.02)	14.19 (2.16)	14.68 (3.26)
	F	6.33 (0.88)	6.59 (0.95)	9.67 (1.66)	9.85 (1.75)	15.16 (2.01)	15.35 (3.29)
2	M	5.63 (1.20)	5.66 (1.01)	8.94 (1.27)	8.32 (1.66)	12.66 (2.42)	12.77 (2.57)
	F	6.25 (0.96)	6.22 (0.94)	8.99 (1.93)	9.62 (2.24)	13.25 (2.55)	13.51 (2.69)
3	M	5.49 (1.07)	5.55 (1.50)	8.60 (2.12)	8.52 (2.01)	11.06 (2.82)	10.81 (2.41)
	F	6.01 (0.85)	5.65 (0.90)	8.50 (1.04)	8.84 (1.35)	12.51 (2.70)	12.38 (2.43)
4	M	5.58 (1.26)	5.53 (1.14)	8.68 (2.26)	8.11 (1.52)	11.77 (2.62)	11.21 (2.27)
	F	5.13 (0.77)	5.47 (0.85)	9.61 (2.11)	9.38 (1.60)	12.63 (2.06)	12.76 (2.14)

Note. Times are reported in minutes and hundredths (not in minutes and seconds as for fitness test standards in Table 5). Group *n*s are reported in Table 3. Grades K–4 correspond to mid-year (December) mean ages of 5–9, respectively.

Criterion-Referenced Reliability

Distance run/walk standards for the Physical Best and Fitnessgram 1-mile tests and for the Physical Best 1/2-mile optional test are presented in Table 5. As indicated in Table 6, all reliability coefficients are acceptable to high ($.70 < P < .95$), except for the Fitnessgram standards for 5-year-old girls on the 1-mile test for both fall and spring testing ($P = .69$ and .51) and for 6-year-old boys and girls on the 1-mile test in the spring ($P = .66$ and .45).

Table 7 gives the percentage of students at each grade level that met or surpassed the Physical Best and Fitnessgram standards on Day 1 of both the fall and spring testing periods. As indicated in the table, a majority of the students in all five age groups did not reach the Physical Best standards for either the 1-mile

Table 5. Physical Best and Fitnessgram run/walk standards (minutes and seconds)

		Age				
		5	6	7	8	9
Physical Best						
½ Mile	M	6:00	5:20	4:50	4:30	4:15
	F	6:20	5:40	5:20	5:00	4:45
1 Mile	M	13:00	12:00	11:00	10:00	10:00
	F	14:00	13:00	12:00	11:00	11:00
Fitnessgram						
1 Mile	M	16:00	15:00	14:00	13:00	12:00
	F	17:00	16:00	15:00	14:00	13:00

Table 6. Fall (F) and spring (S) criterion-referenced reliability estimates (*P*)[a] for Physical Best and Fitnessgram standards

		Age									
		5		6		7		8		9	
		F	S	F	S	F	S	F	S	F	S
Physical Best											
½ Mile	M	.79	.86	.98	.95	.92	.88	.97	.83	.89	.90
	F	.88	.74	.98	.90	.89	.91	.96	.91	.92	.75
1 Mile	M	.70	.70	.94	.89	.95	.92	.90	.94	.95	.93
	F	.75	.88	.88	.73	.81	.87	.95	.94	.92	.90
Fitnessgram											
1 Mile	M	.75	.70	.76	.66	.85	.77	.91	.85	.86	.83
	F	.69	.51	.71	.45	.81	.85	.90	.84	.83	.94

[a] *P* represents the proportion of classification agreement with respect to meeting the criterion standard on the test and retest.

or 1/2-mile tests. A considerably higher proportion, over 50% of the students in 13 of the 20 comparison categories, met the Fitnessgram 1-mile standard.

Discussion

The administratrion of reliable run/walk distances is considered a valuable part of a total fitness program for young children (Cureton, 1982; Whitehead et al., 1990). Because distance running is a form of aerobic exercise and because aerobic exercise has been found to be related to cardiovascular health in adults (Blair, Kohl et al., 1989; Powell et al., 1987), it is important that young children participate in such activities to develop fitness habits that will continue throughout their lifetime. Reliability is an important test characteristic in that, for a test to be valid, it must be reliable. Only when test scores are valid can they be used as the basis for evaluation of individual progress and for goal-setting activities—both of which are important components of a quality physical education program (McSwegin et al., 1988; Pemberton & McSwegin, 1989). Many schools have implemented the Physical Best Goal Setting Contract whereby the teacher assists students in setting personal fitness goals and in measuring their individual progress. Schools are also beginning to monitor students' fitness levels from one year to the next; in some cases fitness scores have become part of students' permanent files. Again, reliability of the test items is an important concern if a student's performance is to be tracked from grade level to grade level.

Criterion-referenced reliability estimates were considerably higher than the norm-referenced estimates for most the age/gender groups, particularly for the more rigorous Physical Best standards. Reliabilities ranged from .70 to .95 (median = .90) for the Physical Best standards and from .45 to .91 (median = .79) for the Fitnessgram standards. The higher values for Physical Best are not surprising because *P* is always larger when there is a large percentage of scores that either meet or do not meet the standard on both the test and retest. This large percentage occurs when the criterion scores are either considerably higher or lower than the mean of the score distribution. A comparison of mean scores in Tables 2 and 4 with the standards in Table 5 indicates that most group means were considerably higher (slower) than the corresponding Physical Best standard. Fitnessgram standards for each age group, on the other hand, were much closer to most of the age group means, thus causing test-retest classifications to be less consistent and *P* values to be lower. These findings are consistent with results from a similar study on pull-ups where *P* values for cut-off scores far from the mean were higher than for scores closer to the mean (Kollath, Safrit, Zhu, & Gao, 1991).

Table 7. Percent of students meeting Physical Best and Fitnessgram standards on Day 1 of fall (F) and spring (S) testing periods

		Physical Best				Fitnessgram	
		½ Mile		1 Mile		1 Mile	
Age	Gender	F	S	F	S	F	S
5	M	41	45	40	31	90	92
	F	38	30	31	28	88	78
6	M	9	26	14	11	60	68
	F	3	16	12	9	41	63
7	M	13	17	13	28	47	66
	F	18	12	18	43	64	79
8	M	5	13	19	41	53	75
	F	4	4	21	31	43	81
9	M	16	20	20	23	38	45
	F	4	20	11	24	38	50

Further research is needed to determine whether the test distances found to be reliable for students in Grades K–4 in this study are also valid; for example, whether they are, in fact, related to cardiorespiratory fitness and health. There is some indication tht running performance in children under 10 years of age may be more highly related to a number of other factors such as maturation, biological change, and running efficiency than it is to aerobic function (Cureton, 1982; Krahenbuhl, Morgan, & Pangrazi, 1989). However, regardless of whether validity is established for the run/walk test for students in these grades, it is recommended that a reliable distance run be included as part of the fitness education and assessment program. With coronary heart disease (the leading cause of death in America) considered primarily of pediatric origin (Caspersen, 1987; Sallis & McKenzie, 1991), it is important to expose children early to the concepts of cardiovascular health and the role of physical activity in preventing health problems. Feedback from the physical education specialists in this study was unanimous concerning the health and educational benefits they believe can be achieved when a fitness education and assessment program is properly implemented in Grades K–4. Test validity, on some occasions, may not be statistically verified (or verifiable) due to the lack of suitable and/or testable criterion measures. The distance run, for example, has a fair amount of content (logical) validity because of its natural association with aerobic exercise but may lack evidence of concurrent or predictive validity (evidence of its relationship to a particular criterion such as VO_2max or cardiovascular health) due to limitations in identifying and measuring suitable criterion variables in children. In any case, satisfactory reliability is an essential test characteristic, particularly considering that test validty is attenuated by test reliability.

In conclusion, results of this study indcate that the distance run can be utilized as a reliable assessment tool for students in Grades K–4 when appropriate age/distance adjustments are made. The 1-mile run/walk has acceptable norm-referenced reliability for students in Grades 3 and 4, with the 1/2-mile the longest acceptable distance for students in Grades K and 1. For students in Grade 2, the 1/2 and 3/4-mile tests tend to be the most reliable with respect to overall estimates across both males and females in the fall. By the end of the school year (May), the 3/4 and 1-mile tests tend to have the best overall reliabilities for 2nd graders. It mght be argued that the 3/4-mile run/walk should be the recommended distance for Grade 2 students, both with respect to test reliability and as a logical transition between the 1/2-mile distance in Grades K and 1 and the 1-mile test in Grades 3 and 4.

Results of the study also indicate that test scores for most age/gender groups, with some exceptions for ages 5 and 6 on the 1-mile test, are acceptably reliable in their classification of students with respect to meeting the standards of the Physical Best and Fitnessgram national test batteries.

References

American Psychological Association. (1985). *Standards for educational and psychological testing*. Washington, DC: Author.

Baumgartner, T., & Jackson, A. (1991). *Measurement for evaluation in physical education and exercise science* (4th ed.). Dubuque, IA: William C. Brown.

Blair, S.N., Clark, D.G., Cureton, K.J., & Powell, K.J. (1989) Exercise and fitness in childhood: Implications for a lifetime of health. In C.V. Gisolfi & D.L. Lamb (Eds.), *Perspectives in exercise science and sports medicine: Youth exercise and sport* (pp. 401-430). Indianapolis: Benchmark Press.

Blair, S.N., Kohl, H.W., Paffenbarger, R.S.,Clark, D.G., Cooper, K.H., & Gibbons, L.W. (1989). Physical fitness and all-cause mortality: A prospective study of healthy men and women. *Journal of the American Medical Association*, 262, 2395-2401.

Caspersen, C.J. (1987). Physical inactivity and coronary heart disease. *The Physician and Sportsmedicine*, 15(11), 43-44

Chrysler Fund-Amateur Athletic Union. (1987). *Physical fitness program*. Bloomington, IN: Author.

Cureton, K.J. (1982). Distance running performance tests in children: What do they mean? *Journal of Physical Education, Recreation and Dance*, 53(8), 64-66

Dennison, B.A., Straus, J.H., Mellits, E.D., & Charney, E. (1988). Chldhood physical fitness tests: Predictor of adult physical activity levels? *Pediatrics*, 82, 324-330.

Institute for Aerobics Research. (1987). *Fitnessgram*. Dallas: Author.

Karvonen, M.J. (1982). Physical activity in work and leisure time in relation to cardiovascular diseases. *Annals of Clinical Research*, 14, 118-123.

Kollath, J.A., Safrit, M.J., Zhu, W., & Gao, L. (1991). Measurement errors in modified pull-ups testing. *Research Quarterly for Exercise and Sport*, 62, 432-435.

Krahenbuhl, G.S., Morgan, D.W., & Pangrazi, R.P. (1989). Longitudinal changes in distance-running performance of young males. *International Journal of Sports Medicine*, 10, 92-96.

Krahenbuhl, G.S., Pangrazi, R.P., Petersen, G.W., Burkett, L. N.,& Schneider, M.J. (1978). Field testing of cardiorespiratory fitness in primary school children. *Medicine and Science in Sports*, 10, 208-213.

McSwegin, P., Pemberton, C., Petray, C., & Going, S. (1988). *Physical Best: The instructor's guide to fitness education and assessment*. Reston, VA: American Alliance for Health, Physical Education, Recreation and Dance.

Paffenbarger, R.S., Hyde, T.T., Wing, A.L., & Hsieh, C. (1986). Physical activity, all-cause mortality, and longevity of college alumni. *New England Journal of Medicine*, 314, 605-613.

Pate, R.R. (1989). The case for large-scale physical fitness testing in American youth. *Pediatric Exercise Science*, 1, 290-294.

PCPFS. (1987). *President's challenge*. Washington, DC: President's Council on Physical Fitness and Sport.

Pemberton,C., & McSwegin, P. (1989). Fitting in fitness: Goal setting and motivation. *Journal of Physical Education, Recreation and Dance*, 60(1), 39-41.

Powell, K.E., Thompson, P.D., Caspersen, C.J., & Kendrick, J.S. (1987). Physical activity and incidence of coronary heart disease. *Annual Review of Public Health*, 8, 253-287.

Ross, J.G., Delpy, L.A., Christenson, G.M., Gold, R.S., & Damberg, C.L. (1987). Study procedures and quality control. *Journal of Physical Education, Recreation and Dance*, 58(9), 57--62.

Safrit, M.J. (1990a). *Introduction to measurement in physical education and exercise science*. St. Louis: Times Mirror/ Mosby College Publsihing.

Safrit, M.J. (1990b). The validity and reliability of fitness tests for children: A review. *Pediatric Exercise Science*, 2, 9-28.

Sallis, J.F., & McKenzie, T.L. (1991). Physical education's role in public health. *Research Quarterly for Exercise and Sport*, 62, 124-137.

Whitehead, J.R., Pemberton,C.L., & Corbin, C.B. (1990). Perspectives on the physical fitness testing of children: The case for a realistic educational approach. *Pediatric Exercise Science*, 2, 111-123.

Decision-Making in Elementary School-Age Children:

Effects Upon Motor Learning and Self-Concept Development

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The purpose of this study was to determine the effects of variable decision-making teaching models upon the development of body coordination and self-concept of children in grades one through five. Students in two socioeconomically equivalent schools of a large, inner-city school system constituted the sample (N = 285) for this study. Intact classroom groups from the experimental school were randomly assigned to one of two experimental treatments. The control school did not receive any treatment. The experimental treatments consisted of two physical education programs which varied only in the type of teacher behavior exhibited. Cheffers' Adaptation of Flanders' Interaction Analysis System (Cheffers, Mancini, & Martinek, 1980) was used to verify the two treatments used. The Schilling Body Coordination Test (Schilling & Kephart, 1976) was used to evaluate motor skill development, and the Martinek-Zaichkowsky Self-Concept Scale (1977) was used to evaluate self-concept development. Results indicated that learners can be given decision-making responsibilities within the physical education environment and, at the same time, maintain a level of motor skill achievement equal to that of learners who have not been allowed to make decisions within the learning environment. No conclusions could be drawn concerning the effects of student decision making upon self-concept development. Additional results indicated that the development of body coordinator is a function of maturation, and that no relationship exists between self-concept and body coordination.

Contemporary education theorists have increasingly emphasized the effects of the total educational environment, and have stressed the concept of having learners assume responsibilities for their learning (Goodlad & Richter, 1966; Kozol, 1972; Postman & Weingartner, 1969); Silberman, 1970). Humanistic concern for each individual learner has become the philosophical foundation for what is now termed "open education" in which teacher and learner intercommunication is encouraged during the learning process.

The primary concern of humanistic physical education is to develop an environment which promotes the development of the total human being in the affective as well as the psychomotor and cognitive domains of learning. Opportunities should be provided which will encourage the development of self-

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concept and decision-making abilities as well as psychomotor skills. Learners should be able to assess perceptions, to validate the authenticity of their perceptions, and to choose that which is useful. This requires that learners have a belief in the self and in the quality and authenticity of their perceptions which, in turn, will lead to successful decision-making capabilities by students.

As teachers attempt to provide a learning environment which will enhance student decision making, they should not suddenly relinquish decision-making responsibilities, but rather should provide opportunities for learners to participate at whatever level they are capable. It is probably unfair to suddenly immerse learners in a situation which requires them to assume immediate and unequivocal control over school curriculum. The learning process should proceed at a speed with which each individual learner can cope (Barth, 1971; Friere, 1973; Holt, 1967, 1972).

Studies previously carried out to determine the effectiveness of a shared-decision-making environment in physical education have generally compared traditional or autocratic teaching with laissez faire or open-education methodology. Researchers have concluded that those students exposed to traditional education have significantly improved motor skills, and that those exposed to laissez faire or open education have significantly improved their self-concept (Jacoby, 1975; LaLance, 1975; Martinek, Zaichkowsky, & Cheffers, 1977).

Martinek et al. (1977) compared the effect of two different decision-making teaching styles upon the self-concept and motor skill development of elementary school children in physical education classes. They concluded that self-concept was enhanced under horizontal (teacher-student sharing) teaching, but that there was no concomitant increase in motor skill development. They also concluded that children exposed to vertical (autocratic) teaching displayed a significant increase in motor skill development, but no concomitant improvement in self-concept.

It was the purpose of this study to modify Martinek's study to determine if teacher behavior under the Horizontal Teaching Method could be so modified as to enhance motor skill development and, at the same time, maintain the improvement of self-concept found by Martinek et al. (1977). In that study, Horizontal Teaching allowed students to choose the skill areas in which they would work, and also to decide what skills they would practice or learn. In this study, the independent variable of teacher behavior for the Horizontal Teaching Model was manipulated to create an environment which provided both opportunities for greater learner decision making within the learning environment and an environmental structure in the form of task requirements established by the teacher. Additionally, this environment provided a teacher who was caring, nurturing, and cognizant of the learner's feelings. Note that the two experimental treatments were carried out by the same teachers whose dispositions toward the students varied only in the patterns of interaction, not in attitudes of warmth or caring.

An experimental learning environment was provided which allowed students exposed to the Horizontal Teaching Model a choice between alternative learning areas, both of which required that students meet criteria within the chosen areas. Those exposed to the Vertical Teaching Model were not allowed any decision-making. A third group constituted a control, receiving neither Horizontal nor Vertical Teaching Model treatments. It was hypothesized that changes limiting the boundaries of student decision making in the independent variable would continue the self-concept improvement, but work to eliminate the decrement in motor skill development. Both experimental groups would be significantly different from the control group. The duration of the treatment was one semester.

Method

Subjects

The sample used in this study consisted of 285 students, grades one through five, from a large, inner-city school system, distributed as shown in Table 1. Two schools, socially and economically equivalent, were represented. Both schools were visited to determine that no procedural differences existed between them. The populations of both schools, located in the same district, were constituted by forced busing. Children were brought to these schools from one geographic and residential area of the city. School A housed two of each grade, one through five, and was designated as the experimental school because it was affiliated with the Boston University Collaborative and the Boston Public Schools. School B, the control school, closely approximated School A in socioeconomic makeup and school structure, and housed one of each grade, one through five. It was not a member of the Boston University Collaborative, and its students did not attend Boston University for physical education as did the children from the experimental school. Regularly scheduled physical education was not included as an element of the school curriculum for either the experimental or the control group.

Table 1
Breakdown of Treatment Groups by Grade and Ethnicity

	Grade					Total	%
	1	2	3	4	5		
			Vertical				
Black	6	10	9	9	7	41	39.8
White	7	1	5	5	4	22	21.4
Spanish & Oriental	8	9	8	5	10	40	38.8
Total	21	20	22	19	21	103	100.0
			Horizontal				
Black	8	9	9	8	6	40	38.8
White	4	4	3	6	6	23	22.3
Spanish & Oriental	9	10	7	5	9	40	38.8
Total	21	23	19	19	21	103	99.9
			Control				
Black	8	10	6	14	2	40	38.5
White	10	8	6	8	7	39	37.5
Spanish & Oriental	4	7	4	7	3	25	24.0
Total	22	25	16	29	12	104	100.0
Grand Total						310 (compl. data = 285)	

Procedure

Informed consent was obtained from each of the subjects. As there were two classes at each grade level in the experimental group, each was randomly assigned to an experimental treatment. Each of the two experimental treatment groups was composed of five intact classroom groups, grades one through five, and students attended Boston University with their classroom groups. Prior to attendance at Boston University, the experimental groups and the control group were administered the Martinek-Zaichkowsky Self-Concept Scale (MZSCS) at their home schools. The first activity period at Boston University was utilized to administer the Schilling Body Coordination Test (SBCT) to the two experimental groups. During this same week, the control group was given the SBCT at their home schools. During the last week of the semester, the SBCT was administered to the two experimental groups at Boston University, and to the control group at their home schools. During the last week of the semester the MZSCS was administered to all subjects in their home schools. All testing was administered by the investigators and the teaching assistants from Boston University.

During the treatment period, no formal physical education program was provided for any of the subjects at their home schools, as neither school provided physical education experiences for their students as part of the regular school curriculum. The only physical education provided for them was that which they received as part of the experimental treatments. The treatment periods were 45 min in length, with three periods each day. During the first period, grades one and two attended as a single group, grades three and four during the second period, and grade five during the third period.

Curriculum

The curricular skill areas used included movement exploration activities outdoors—utilizing balls, ropes, hoops, wands—physical fitness activities, parachute, folk dancing, and modified Project Adventure activities. In the gymnasium, the gymnastic areas of balance beam, side horse, parallel bars, uneven parallel bars, trampoline, ropes, and tumbling were used. A series of progressive performance objectives and related criterion-referenced evaluation items were developed for each of the curricular areas. Task cards containing the performance objectives and correlated visual teaching-learning materials consisting primarily of charts and diagrams suitable for student use were prepared. Two record forms corresponding to the task cards were developed. One was suitable for teacher use and one for student use.

Curricular requirements were established for learners within the Horizontal Teaching Model. These included (1) that learners must participate in at least three different activities each day, and (2) that they must complete the requirements at any one station before moving on to another. The same requirements were set for the Vertical Teaching Model. Teachers were asked to expose their students to three different activities each period and to encourage students to complete task requirements before the group moved on.

Teachers

Teachers for this study were seven graduate assistants from the Department of Movement, Health, and Leisure, Boston University. Teachers attended a workshop for two weeks prior to the beginning of the experimental treatments. These workshops were designed to familiarize teachers with the models of teaching and with the curriculum with which they would be working. It was necessary that all teachers be able to utilize both experimental teaching models because all teachers worked with both experimental groups.

The two teaching models in this study were called the Vertical Teaching Model and the Horizontal Teaching Model. Verticality is described as a continuum in which either the teacher or the learner may be controlling the teaching-learning process. If the learner is in control, the process is that which has been referred to as laissez faire; if the teacher is in control, the process is that which has been referred to as autocratic. In this study, the Vertical Teaching Model is that which is described as autocratic, or teacher-controlled. Horizontality is described as a continuum in which both teacher and student are active in the learning process. The continuum ranges from that point where the teacher and learner are not effectively communicating to that point at which they are effectively communicating. In this study, the Horizontal Teaching Model is that which is described by the horizontal continuum in which teacher and learner effectively communicate and materialize through the "shared-decision-making" methodology.

Treatment

Learning centers containing the curricular materials previously described were established on the field or in the gymnasium. To ensure that both experimental groups were exposed to the same curriculum, the same learning centers were set up on Thursday as were set up on Tuesday. In the Vertical Teaching Model treatment, learners were assigned to specific teachers with whom they remained for the duration of treatment. The learning environment was structured and controlled by the teacher, who used lecture and demonstration as a method of teaching. Learners performed only when allowed to by the teacher.

In the Horizontal Teaching Model treatment, learners were not assigned to specific teachers. Instead, they were allowed to choose the skill area in which they would work. When learners in this treatment model arrived at the gymnasium, they were given their task cards as they entered and carried the cards with them for the duration of the class period. When learners arrived at their chosen activity, they looked up the task requirements on a large chart which corresponded to their individual task cards. Teachers were available at each activity area to challenge learners through the use of questioning and verbal encouragement. Interaction and dialogue between teacher and student were encouraged.

Cumulative student record cards were maintained for both experimental groups during the treatment period, providing a record of the number of performance objectives completed by each student in each of the curricular areas.

Treatment Validation

Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS), a valid and reliable observer system which records both verbal and nonverbal behavior, was used to verify that teachers were utilizing teaching behaviors which were indicative of vertical and horizontal teaching (Cheffers, Mancini, & Martinek, 1980; Mancini, Cheffers, & Zaichkowsky, 1976; Martinek, Zaichkowsky, & Cheffers, 1977). During the fifth (precoding) and tenth (postcoding) weeks of treatment, all teachers were videotaped, and their teaching behaviors coded using CAFIAS. Four teachers were randomly selected and the results of their coding are reported in this study.

Teacher behavior for both pre and postcoded lessons of the Vertical Teaching Model displayed a 5-6-18-6 teaching pattern. This pattern is described by CAFIAS as one in which the teacher gives information (5), then directions/orders (6), followed by predictable student nonverbal responses (18), followed by the teacher giving further directions/orders (6). It should be noted that these are predominant patterns which, though direct, were not punitive or harsh. Directions given in this experiment were given in a kind and open fashion. No attempt was made to discriminate against students in Vertical Teaching or to create a negative atmosphere in teacher decision making as opposed to student decision sharing. Pre and postcoded behavior during the Horizontal Teaching Model for the same teachers displayed a 4-5-8-18-2-3-4 teaching patterns. This pattern describes the teacher as questioning (4), then giving information (5), followed by predictable student verbal response (8), and student nonverbal response requiring synthesis and evaluation(18), followed by verbal teacher support (2,3), and additional teacher questioning (4).

Analysis of teacher-student interaction utilizing the Wilcoxon t was performed to determine if the two teaching methods were significantly different from each other. The results, presented in Table 2, show that the amount of teacher verbal questioning, teacher nonverbal response, and total student initiative in the Horizontal Teaching Model were significantly ($p<.10$) greater when compared with the Vertical Teaching Model. During Horizontal teaching, teachers asked a significantly greater number of questions, responded nonverbally to students a significantly greater number of times, and students, during Horizontal teaching, displayed a significantly greater amount of initiative in the learning process.

An environment developed in the Horizontal Teaching Model which encouraged and allowed student initiative and decision-making to be displayed at whatever level the student was capable, and also provided for teacher encouragement and control. Martinek and Zaichkowsky (1977) found that children who were given the opportunity to share in decision making showed greater interaction with the teacher, displayed greater initiative, and contributed more to the learning situation. These findings are congruent with the results of this study.

Testing Instruments

The Schilling Body Coordination Test (SBCT), used to evaluate body coordination, was developed and validated in West Germany by Schilling and Kephart (1976) to diagnose gross motor deficiencies in children. Reliability was established by the test-retest correlation method on 1,228 kindergarten children (r = .97). Schilling and Kephart (1976) report a validity coefficient of .70 with criterion of brain damage and .50 to .60 with a short version of the Lincoln-Oseretsky Scale. The SBCT looks at overall skill development with major emphases in the areas of agility, coordination, balance, reaction time, speed, and power.

Self-concept development was evaluated by the Martinek-Zaichkowsky Self-Concept Scale (MZSCS)(Martinek & Zaichkowsky, 1977):

The scale is nonverbal and was designed primarily to measure global self-concept of elementary and middle school children. Since the scale is nonverbal, it requires little or no reading ability and can be administered to non-English-speaking groups. It consists of 25 items that measure attributes such as appropriate behavior; intellectual, social, and physical aspects of a child's self-concept. In order to avoid acquiescence in answering in a single direction, the MZSCS also provides lie scale items (p.2)

The MZSCS reliability was established using a Hoyt Coefficient (.88). Concurrent validity was determined through comparison with the Piers-Harris Self-Concept Scale and the Coopersmith Self-Esteem Inventory (Coopersmith, 1967; Martinek & Zaichkowsky, 1977; Piers, 1969). The fact that it contains only 25 items is an advantage particularly with elementary children, because it avoids confusion. It is preferable to scales with higher numbers of items (50-100), the last half of which are so often invalidated due to fatigue and boredom variables.

Results

Planned comparison (Winer, 1962) indicated that the two experimental treatment groups were not significantly different from each other in body coordination, $F(1,284) = 2.51$, $p>.05$, and that the two experimental treatment groups were significantly better than the control group in body coordination, $F(1,284) = 8.61$, $p<.01$.

The mean for the Vertical, Horizontal, and Control Treatment groups were 150.84, 145.27, and 136.65, respectively. The standard deviations for the Vertical, Horizontal, and Control groups were 41.27, 45.69, and 28.12, respectively.

A significant F-ration, $F(4,234) = 4.20$, $p<.003$, was obtained for the effect of grade on body coordination. The Scheffe' post hoc test indicated that the mean score for grade five in total body coordination was significantly greater than for grades one, two, three, and four, and that the mean posttest scores for grades two, three, and four were significantly greater than for grade one ($p<.01$). The adjusted posttest means for grades one, two, three, four, and five on the SBCT were 115.16, 132.35, 146.88, 149.52, and 186.57, respectively.

A 2 x 3 x 5 ANCOVA (using the pretest as covariate) was used to test for the effect of sex, treatment, and grade on self-concept. No significant differences were found for self-concept across the three experimental groups. The means for the Vertical, Horizontal, and Control Treatment groups were 22.96, 22.73, and 22.44, respectively. The standard

Table 2
Results of the Statistical Analysis of Teacher-Student Interaction Under Vertical and Horizontal Teaching

	Teacher								Wilcoxon t
	1		2		3		4		
	V	H	V	H	V	H	V	H	
Percentage of Teacher Verbal Contribution	48.62	30.77	40.57	34.94	37.85	53.18	36.88	33.20	3
Teacher Verbal Questioning	2.13	23.61	4.65	21.35	2.94	27.66	8.57	24.39	0*
Teacher Non-Verbal Response	93.55	100.0	91.30	100.00	88.89	97.14	95.92	100.00	0*
Total Student Contribution	23.20	41.96	40.57	37.82	34.58	24.55	27.76	34.43	4
Total Student Initiative	11.90	22.50	4.04	23.73	5.41	22.22	5.48	19.05	0*

*$p < .10$

deviations for the Vertical, Horizontal, and Control group were 3.62, 3.88, and 4.11, respectively.

The Pearson product moment coefficient of correlation was computed to determine whether a relationship existed between body coordination and self-concept. The resulting r of .14, $p > .05$ indicated that no significant relationship could be demonstrated, based upon the results of this study.

At the conclusion of treatment, student task and card records were subjected to a t test to determine whether or not a significant difference existed between the number of learning tasks completed by each of the two experimental groups. No significant difference was found. The mean and standard deviations were 42.8 and 3.08 for the Vertical Treatment group and 39 and 10.61 for the Horizontal Treatment group.

Discussion

The results of this research support the thesis that giving students a voice in determining their educational activities during physical education may not result in a decrement in learning. Students exposed to the Horizontal Teaching Model did not differ in level of body coordination from the students exposed to the Vertical Teaching Model as measured by the SBCT. Relinquishing some decision-making authority by the teacher did not result in a decrement in body coordination. The two experimental groups significantly improved their posttest scores when compared with the control group, indicating that formal instruction in physical education is necessary if learners are to improve in motor skill development.

Additional findings indicated that students in both learning environments were exposed to the same number of learning tasks. Students who were allowed to make a choice concerning the skill areas in which they would work chose a variety of skill areas, and did not limit themselves to one or two favored ones ($p > .05$).

The hypothesized significant difference in self-concept between the two experimental groups and the control group, and between the two experimental groups, was not supported by the experimental results. No significant difference was found in the self-concept development of children under the several experimental teaching treatments. Martinek et al. (1977) found a significant difference in self-concept between their horizontal model and their control group, but no significant difference between their Vertical and Horizontal model groups.

A significant difference was found between grades and total posttest scores on the SBCT. As grade increased, so, too, did achievement. This is consistent with the belief of Espenscade and Eckert (1967), who state that: "In general, the development of motor skills proceeds according to the laws which govern the physiological maturation of the child ..." (p.135).

The results of this study indicate that learners can be given some decision-making responsibility within the physical education learning environment and, at the same time, maintain a level of achievement equivalent to the achievement of students exposed to a learning environment in which the teacher is the decision maker. Public school physical education teachers who work with elementary-school-age children may find that children can make decisions concerning the learning areas within physical education in which they will work, and that they can plan constructively to carry out those learnings which they have chosen because of valid, personal interests.

No claim to superiority can be made on the basis of these findings, but the changes in the motor skill measures could have resulted from independent changes in teaching methodology. Certainly no decrements occurred in posttest measures as a result of the increased structure added to the Horizontal (student decision making) Model.

References

Barth, R.S.(1971). So you want to change to an open classroom. *Phi Delta Kappan*, 53, 97-99.

Cheffers, J.T.F., Mancini, V., & Martinek, T. (1980). *Interaction analysis: An application to nonverbal activity*. Minneapolis: Association for Productive Teaching.

Coopersmith, S. (1967). *The antecedents of self-esteem*. San Francisco: Freeman.

Espenschade, A.S., & Eckert, H.M. (1967). *Motor development*. Columbus, OH: Charles E. Merrill Publishing Co.

Friere, P. (1973). *Education for critical consideration*. New York: The Seabury Press.

Goodlad, J.I., & Richter, M.N. (1966). *The development of a conceptual system for dealing with problems of curriculum and interaction*. H.E.W. contract #SAE 80204, Project #454, Los Angeles: UCLA Press.

Holt, J. (1967). *How children learn*. New York: Pitman Publishing Corporation.

Holt, J. (1972). *Freedom and beyond*. New York: E. P. Dutton & Co.

Jacoby, D.J. (1975). A comparison of the effects of command, reciprocal, and individual styles of teaching on the development of selected sports skills (Doctoral dissertation, Ohio University, 1975). Dissertation Abstracts International, 36, 7272A. (University Microfilms No. DAH-10310)

Kozol, J. (1972). *Free schools*. Boston: Houghton Mifflin Co.

LaLance, R.E. (1975). A comparison of a self-directed learning approach to a traditional instructional approach in beginning tennis (Doctoral dissertation, Middle Tennessee State University, 1975). Dissertation Abstracts International, 36, 7273. (University Microfilms No. DAH76-10249)

Mancini, V., Cheffers, J.T.F., & Zaichkowsky, L.D. (1976). Decision-making in elementary children: Effects of attitudes and interaction. *Research Quarterly*, 47, 349-356.

Martinek, T.J., & Zaichkowsky, L.D. (1977). *Manual for the Martinek-Zaichkowsky self-concept scale for children*. Jacksonville, IL: Psychologists and Educators, Inc.

Martinek, T.J., Zaichkowsky, L.D., & Cheffers, J.T.F. (1977). Decision-making in elementary age children: Effects on motor skills and self-concept. *Research Quarterly*, 48, 349-357.

Piers, E.V. (1969). *Manual for the Piers-Harris children's self-concept scale*. Nashville, TN: Counselor Recordings.

Postman, N., & Weingartner, C. (1969). *Teaching as a subversive activity*. New York: Delacorte Press.

Schilling, F., & Kephart, E.J. (1976) The body coordination test. *Journal of Physical Education and Recreation*, 47, 37.

Silberman, C. E. (1970). *Crisis in the classroom*. New York: Random House.

Winer, B. J. (1962). *Statistical principles in experimental design*. New York: McGraw-Hill Book Co.

Fitting Together

Physical Education Specialists and Classroom Teachers

Programs such as this can help elementary
school physical education specialists work toward
their goals in cooperation with classroom teachers.

Becky W. Pissanos
Ina G. Temple

One out of ten elementary school students takes physical education from both a specialist and a classroom teacher (Ross, Dotson, Gilbert, & Katz, 1985). In situations where this arrangement exists, physical education specialists are frequently frustrated by the quality of physical education instruction provided by the classroom teachers (Pissanos, 1989) and classroom teachers are often frustrated because they find the purpose of physical education and their roles in teaching it to be nebulous (Brumbaugh, 1987). Specialists (Pissanos, 1989) and classroom teachers (Brumbaugh, 1987) acknowledge the need for greater communication between the two, but suggest that the teaching realities associated with their work worlds often prevent this from happening. Without communication, the specialist(s) and classroom teachers working in the same school tend to conduct their physical education programs independent of each other, with little continuity and limited progress toward accomplishing the program goals.

The reality appears to be that a limited number of elementary school children have daily physical education, and many who do often do so in an uncoordinated program taught by both a physical education specialist and a classroom teacher. The question becomes, how can a physical education program accomplish both a motor skill development goal and a health-related fitness goal (both requiring a significant amount of time to develop) when faced with physical education's current status in many elementary schools?

Under the present circumstances, the physical education profession must seek curricular alternatives to meet important program goals. The project described here was one attempt to find a feasible alternative for addressing a health-related fitness goal in an elementary school in which the physical education specialist and the classroom teachers shared responsibility for the physical education program. Specifically, the project had two purposes. The first was to examine classroom teachers' ability to improve their students' health-related physical fitness under the guidance of a physical education specialist. The second purpose was to gain insight into the classroom teachers' and specialist's perceptions of the curricular alternative project studied.

Project Participants

The participants in this study were four elementary school classroom teachers, the students in their self-contained classrooms (N = 88), and one elementary school physical education specialist. All participants were faculty or students within the same school in a large southern city/county school system. The third

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grade level was randomly selected to participate in the study out of a pool of three grade levels (3rd, 4th, and 5th). Two of the four third grade classes and their teachers were randomly assigned to serve as the control group and the other two classes were identified as the treatment group. One of the two classes assigned as a treatment group had been identified as academically gifted. As reported by the physical education specialist, all four classes were composed of children at all levels of motor skill and fitness development

Background

In order to meet state requirements, the physical education program for this school system was designed so that each physical education specialist assigned to an elementary school provided students with instruction for 30 minutes one day a week. During their students' class period with the specialist, the classroom teachers were given a planning period free of instructional or supervisional responsibilities. On the remaining four days of the week, the classroom teachers were to provide physical education instruction. The intent of the plan was for the specialist to introduce content in his or her class period with the students and then, on the remaining four days, for the classroom teacher to provide follow-up work that reinforced the content.

System-wide, the plan was not as effective as originally conceptualized. In the school in which this project took place, the classroom teachers did not conduct follow-up programs. The school principal instructed the classroom teachers to provide a planned, organized activity during their physical education period with the children. Typically, the classroom teachers' physical education classes consisted of the children playing different types of organized recreational games. Frequently, in the lower grades, the first part of a class period was spent in a game activity and the latter part was spent with the children participating in free play.

The principal informed the specialist that in addition to her teaching load she was to serve as a physical education resource for the classroom teachers, but was not responsible for coordinating or supervising the physical education experiences provided by the classroom teachers. The specialist fulfilled her nonteaching responsibility by providing the classroom teachers with monthly information sheets regarding the weekly lesson focus for her classes and suggestions for follow-up activities. She also conducted physical education workshops and provided the classroom teachers with access to extra physical education equipment. The content focus of the specialist's one-day-a-week program was on motor skill development. She did, however, introduce fitness as a concept and throughout the school year encouraged student participation in fitness activities.

The Project Year

During the teacher's work week prior to the students' first week of school, all four classroom teachers in this project attended an in-school inservice workshop conducted by the specialist. The workshop focused on (a) the differences between skill-related and health-related fitness, (b) guidelines for developing fitness, (c) fitness safety, and (d) fitness activities and resources.

For the first three weeks of school, in their physical education classes with the specialist, all third grade students were provided with information about the importance of being physically fit and information about how to improve their fitness levels. In class, the students also participated in fitness development activities. The students were encouraged to take part in fitness activities (i.e., jogging, swimming, riding bicycles, and rope jumping) after school as well. At the completion of the three-week period, the specialist continued to encourage the students to participate in fitness activities, but only focused on motor skill development in her scheduled classes with the students.

The teachers of the two treatment classes agreed to provide their students with a minimum of 15 minutes of health-related physical fitness developmental activities three times a week during the teachers' physical education instructional periods. In return, the specialist agreed to provide these two teachers with an additional planning period by scheduling a second physical education instructional period with their students.

Each month during the school year, the specialist provided the two treatment classroom teachers with a fitness activities calendar. On the calendar, the names of specific fitness activities were listed on the days that the classroom teachers were responsible for the physical education instruction of their students. The names of the activities listed corresponded to the more detailed descriptions given the teachers during the preschool workshop. Additional activities and directions for their implementation were periodically provided. The specialist also met informally with the teachers throughout the school year to provide information and encouragement. The control classroom teachers were not provided with the fitness activities calendars, the additional materials, nor additional class periods with the specialist.

Data Collection and Analysis

As previously indicated, the purpose of this project was twofold. The first was to examine classroom teachers' ability to improve their students' health-related physical fitness under the guidance of a physical education specialist. The second purpose was to gain insight into the classroom teachers' and specialist's perceptions of the curricular alternative project studied. The study addressed both purposes from different research perspectives. One perspective addressed the first purpose of this project and was an objective measure of changes in children's health-related fitness levels. The second perspective involved interviews of the faculty participants involved and was designed to address the second purpose of the study.

Fitness assessment. All four classes were given the AAHPERD Health-Related Fitness Test (1980) in October and May of the project year. The battery consisted of four test items: one-mile run, sit-and-reach, sit-ups, and sum of skinfolds (subscapular and tricep). All tests were administered according to the test protocol by trained personnel. No other fitness evaluation was conducted between the fall and spring of the project year.

Table 1. Third-Graders' Fitness Assessment Results
(Group Means and Standard Deviations)

	Test Time				
	Pretest		Posttest		
	X	S	X	S	Diff.
One Mile Run (time in seconds)					
Treatment Group 1 (n = 22)	833.22	154.70	691.70*	115.94	–141.52
Treatment Group 2 (n = 18)	718.50	157.38	634.83*	92.17	–83.67
Treatment Comb.	782.85		666.73		
Control Group 1 (n = 26)	828.96	146.28	769.31	132.70	–59.65
Control Group 2 (n = 22)	827.38	173.39	765.48	116.43	–61.90
Control Comb.	828.26		767.60		
Sum of Skinfolds (millimeters)					
Treatment Group 1	17.6	8.42	19.2	11.39	+1.6
Treatment Group 2	15.6	3.30	15.2	6.37	–0.4
Treatment Comb.	16.7		17.5		
Control Group 1	17.5	9.20	18.1	9.49	+0.6
Control Group 2					
Control Comb.	18.4		20.2		
Sit-Ups (number completed in 30 seconds)					
Treatment Group 1	24.4	7.85	31.6	8.55	+7.2
Treatment Group 2	27.1	9.05	31.6	8.13	+4.5
Treatment Comb.	25.6		31.6		
Control Group 1	28.3	6.55	30.5	8.58	+2.2
Control Group 2	30.2	10.75	30.6	7.60	+0.4
Control Comb.	29.2		30.5		
Sit and Reach (centimeters)					
Treatment Group 1	23.3	5.23	24.9	6.17	+1.6
Treatment Group 2	28.2	6.94	30.2	5.83	+2.0
Treatment Comb.25.6		27.3			
Control Group 1	23.8	4.93	24.9	4.92	+1.1
Control Group 2	23.1	7.39	24.1	6.94	+1.0
Control Comb.	23.5		24.5		

* p< .05

The average pretest and posttest scores were calculated for each of the four groups (classes) for each of the four tests; standard deviations were also calculated. For each test, the means (averages) were compared (Analysis of Variance) to determine whether or not the groups differed before treatment, were different after treatment, and/or the two treatment groups improved more than the two control groups.

Because intact classes were used in the project and there appeared to be some differences in performance among the groups on the pretests, a second set of analyses (Analysis of Covariance) was done. For each test, the pretest group averages were adjusted to make the performance of the groups more comparable. Using the adjusted pretest means as a control, differences between groups on the posttest scores were then analyzed.

Interviews. Since curricular decision-making is a complex human enterprise that must take into consideration the context of schooling, particularly the practical considerations of the work world, the perspective of the participants was deemed important. At the end of the school year, the classroom teachers and the specialist were independently interviewed to provide their perspectives on their involvement in the project and on the potential for success of programs of the same design. The semi-structured, open-ended interview approach was utilized. The interviews were audiotaped, transcribed, and studied through inductive analysis (Patton, 1980).

Fitness Assessment Results

Pretest and posttest group averages (X) and standard deviation (S) for each test are shown in table 1. Examination of the data in the table reveals that the averages of all groups (treatment and control) improved from pretest to posttest on all tests except for one group on the body composition (sum of skinfolds) measure. For that test, Treatment Group 2 had a lower posttest score than on the pretest, suggesting that Treatment Group 2 had a decrease in body composition following the fitness project while Treatment Group 1 and both control groups increased in body composition.

The statistical analyses (Analyses of Variance) indicated that, when all four groups were considered together, the differences between pretest and posttest were significant. This was true for all four tests. The change from pretest to posttest, however, was not the same for all four groups. Further analysis showed that for the sit-ups pretest, Treatment Group 1 performed significantly fewer sit-ups than Control Group 2, whereas there was no statistical difference among the four groups on the posttest. Thus, Treatment Group 1 improved more than Control Group 2 on the sit-ups test.

For the second set of analyses (Analyses of Covariance), when the four classes were equalized on the pretest scores, differences among classes on the posttest scores were only identified for the one-mile run. For this test, both treatment classes were significantly better than both control classes; the two treatment classes were not different from each other nor were the two control classes. Thus, it appears that the special fitness program affected the improvement on the one-mile run. It may also be noted that for the run the standard deviations for the posttest scores were less than for the pretest for all four groups. That is, each of the classes became more homogeneous, relative to one-mile run performance, from pretest to posttest. A similar pattern of change in group variability (differences in standard deviation from pretest to posttest) did not occur for the other test items.

Interviews with Classroom Teachers

The classroom teachers' interview questions addressed three main points: (1) their general patterns of project involvement, (2) their personal reactions to their involvement, and (3) their beliefs regarding the potential for the success of programs of this design. In describing the first point, their general patterns of involvement, the two treatment teachers identified very different orientations.

Patterns of involvement. Pam (names have been changed to protect participants' anonymity), the teacher of the gifted class (Treatment Group 2), explained that, utilizing the suggestions provided by the specialist, she developed specific fitness lesson plans for each of the three days on which she was responsible for her students' physical education program. Sally, the other teacher (Treatment Group 1), indicated a more casual approach in which she basically repeated the same pattern each day with an occasional special activity from the fitness activities calendar added. Each of the lesson plans developed by Pam focused on two areas of health-related fitness. One of the areas was always cardiovascular fitness and the second area was selected on a rotating basis. Sally typically only focused on cardiovascular fitness in that she required the children to run for a specified distance each physical education class period. The teachers of the control group indicated that their pattern of instruction during the project year followed the same pattern as previous years with little or no focus on fitness. They did, however, note one exception. Due to the development of an eighth-of-a-mile running trail around the school playground, students were instructed to run more frequently than in past years. The teachers of the control group, however, explained that their plans infrequently included this activity.

Reactions to involvement. The treatment teachers' reactions to their participation in the project, the second main interview point, were particularly interesting. Sally stated, "I enjoyed it—I should have done more with it. At the same time, I got as tired of it as the kids did, but it's because I didn't really use the handouts (the materials provided by the specialist). Some of them I used—some of them I didn't."

Pam discussed her adjustment to planning for physical education. She explained that in the past she had spent very little time selecting games for the children to play during her physical education classes. As a participant in the project, she felt a greater responsibility for what she did during her physical education program days. She explained that initially, even with the workshop and fitness activities calendars, her planning took a great deal of time because of her lack of self-confidence. She said:

> Sitting here in the afternoons (after school) working through my plan book, I found myself saying, "What am I going to do?" You know, like planning for a reading session, but it was taking me twice as long to plan for 30 minutes of something else. In the beginning I lacked self-confidence. I look at p.e. teachers—you really are specialists—you have that training. My training in physical education is one course in kiddie p.e., what we call it ...I was scared, but I took it (teaching fitness activities) seriously—as seriously as teaching something else new.

When Pam was asked for suggestions of things that could have been done to make her feel more comfortable, she indicated that she did not think that there was anything that someone else could have done. She continued, "I just had to get in there and try and prove to me that I could do it." She did indicate, however, that the preschool workshop had been most helpful to her in planning because she knew very little about fitness. The activities calendar then helped reinforce the new information.

Both treatment teachers indicated difficulty in getting themselves and their students motivated to focus on fitness for 15 minutes of their three-times-a-week physical education class periods. Sally stated, "I had a hard time with it because I hate for them (the children) to be so highly structured all day ... In that half-hour I feel like I should give them more choice, more flexibility." Sally explained, however, that as the year progressed, the children became more motivated because they were able to run farther with less effort. In fact, the children started competing with their personal distance records from the previous day.

Pam explained that her job became much easier once the children made a commitment to improving their fitness levels. She said, "The thing that surprised me was that the children could take some of the responsibilities. They realized that their bodies felt different after some days. I tried harder because the children knew why they were doing it. They had something to work for—especially these children in here (in a gifted class). In the end, my job became fairly effortless."

Both treatment teachers indicated that the greatest motivation for having a fitness focus three days a week was the project arrangement of the specialist offering their classes an extra physical education class period each week. Pam explained:

> I enjoyed having (physical education with the specialist) twice a week. That was a real luxury. I have to admit it—it was a luxury to have that one extra period a week. It gave me more of a reason to work hard for those 15 minutes three times a week. It was sort of like my reward. I knew if did those 15 minutes I had a reward coming—it was kind of an incentive for me to do it. It was also kind of an incentive for the children too. It was funny how it worked for both of us. The control teachers also indicated that they would be willing to focus on fitness if their students were given the extra physical education class period.

Sally believed that she would have done more during the project year if she had been "monitored more closely." She explained, "Very often what we can do and what we are willing to do on our own is very different."

Pam, on the other hand, stated that she was able to "respond favorably" to the project because there was no one closely monitoring her. She stated that although the specialist periodically checked with her, she had not felt pressured to meet some unrealistic standard. She believed this lack of pressure was a significant factor in her positive feelings about her participation in the project.

This part of the interview concluded with the classroom teachers explaining that their participation in the project had provided them with a different view of what they could do in their portion of the physical education program. Sally stated that despite her beliefs that children needed more release time from the structure of the school day her participation in the project had helped her to see the value of increasing the fitness emphasis in her physical education program. She said, "Fifteen minutes isn't that much to ask, they can still do something else for 15 minutes."

According to Pam, even though her old pattern was easier, her experiences during the project year had changed her attitude toward her physical education program. She explained, "I was excited for p.e. and about p.e. this year. In looking back, I'm proud of what I did this year and in looking forward, I'll continue to do p.e. differently."

Success potential for the project. In discussing the third main interview point, regarding the success potential of the project design, both Sally and Pam indicated that they thought programs in which classroom teachers were responsible for fitness (with the guidance of the specialist) could be successful. They explained, however, that the most difficult hurdle to overcome would be getting classroom teachers motivated. All four project classroom teachers worked in a situation where the school and school system administrators held relatively low expectations for the content of classroom teachers' physical education programs. The treatment teachers explained that without greater expectations, classroom teachers often choose to spend their time and energy on other school subjects.

Both Sally and Pam indicated, however, that if their school principal told them that they were responsible for the fitness education of their students, they would do their best to meet the added responsibility. Sally said, "It is the same way in anything—anytime we adopt a new series or anything different—we say it's too difficult and we can't do it. But eventually we come around." Other factors such as a highly structured school day and a limited physical education knowledge base were also given as influencing the potential for the success of programs such as the one in this project.

Interviews with the Specialist

Lynn, the specialist, addressed three main points in the interviews: the nature of her involvement in the project, her motivation for participating in the project, and her beliefs regarding the success potential of such programs. In addition to planning and conducting the preschool workshop on physical fitness, the specialist was responsible for three primary components of the project: (1) providing the teachers of the treatment group with monthly fitness activities calendars and supplemental materials; (2) providing the two treatment group classes with one additional physical education instructional period each week; and (3) periodically talking informally with the two treatment teachers to provide support and encouragement.

In discussing her motivation for participation in the project, Lynn stated that she was very pleased to be a part of a project that provided the students with a physical education program that addressed both motor skill development (her focus) and health-related fitness (the classroom teachers' focus). She explained that specialists teaching in one-day-a-week programs are forced to make curricular content decisions based on practicality rather than student needs. Her frustration over having to make these curricular choices in the past was the basis for her contribution to the project.

Lynn had mixed feelings about the potential for the success of programs in which the specialist and classroom teachers work together to meet physical education program goals. She believed that success is possible, but was not an automatic feature of such programs. According to Lynn, two factors would influence that potential: the school administrators' values, policies, and expectations regarding physical education, and the commitment level of the teachers involved, particularly that of the classroom teachers.

Lynn thought that the most significant factor in the success potential of such projects was the value that school administrators placed on physical education or physical fitness instruction. If the school administrators valued physical education as an important part of the school curriculum, they would more likely develop policies related to physical education and require that students be provided with quality instruction. Once that expectation was realized, Lynn thought the classroom teachers would more likely be motivated to participate in programs that provided students with appropriate fitness activities.

Lynn believed that the current project reflected the importance of the second factor, teacher commitment. She explained that the two classroom teachers involved in the treatment portion of the project represented two different levels of teacher commitment to the project. Pam had made up her mind that designing and conducting fitness experiences for her students was one of her job responsibilities and therefore, dedicated the time and energy necessary to meet those responsibilities.

Sally, on the other hand, was only willing to meet what she considered minimal expectations. Lynn concluded that this difference in teacher commitment levels would have a significant impact on the potential for success of projects of this nature.

Lynn believed that two positive features of this project increased the potential for success. One was that the design of the project reduced the breadth of content which the classroom teachers were expected to cover in their physical education programs. Since physical fitness is closely related to two other areas of

Working Together To Meet Program Goals

Physical education specialists and classroom teachers can work together to meet physical education program goals, using the following guidelines:

1. If the physical education specialist takes responsibility for motor skills development and the classroom teachers take primary responsibility for the development of health-related fitness, students may receive a more comprehensive physical education program.

2. A "packaged" health-related fitness curriculum for classroom teachers can be successful if conducted in conjunction with and under the supervision of a qualified physical education specialist. This packaging may provide classroom teachers with a clear picture of what is expected of them as physical education teachers.

3. Teachers who share responsibility for the physical education program should have time to meet monthly to discuss concerns related to their instructional responsibilities. The physical education specialist should have some time in his or her schedule to serve as a resource person for the classroom teachers.

4. It is critical that school administrators support and hold accountable all teachers responsible for the physical education programs in their schools.

the school curriculum for which classroom teachers are responsible, science and health, the potential for an interdisciplinary approach to teaching physical fitness is greater.

Second, the "packaging" of the fitness curriculum promoted its success. Lynn explained that in each of the other curricular areas the classroom teachers were required to teach, they were provided with objectives, competencies, materials, and resources. In physical education, however, the classroom teachers were typically left with no information other than the county physical education curriculum guides. Lynn believed that the absence of a formal "package" for physical education contributed to the classroom teachers' perceptions that physical education was of less importance than other curricular areas. The ease with which classroom teachers could be provided with a fitness package appealed to Lynn. She explained that she did not think that motor skill development could be so easily addressed. Lynn stated that if classroom teachers were provided with a fitness package similar to the ones they received in other curricular areas, they would be more likely to teach health-related fitness. She concluded that if she continued to concentrate on motor skill development in her portion of the physical education program and the classroom teachers focused on fitness, the potential would be much greater for meeting physical education program goals in both of these areas.

Summary and Implications

Although the statistical analyses produced mixed results concerning the effect of the special program (treatment) on fitness characteristics, there is some evidence that elementary school classroom teachers, with the appropriate curriculum and professional guidance (and as a supplement to the specialist's physical education program) can affect the improvement of the fitness levels of their students. For example, Treatment Group 2 had a decrease in body composition following the fitness program while Treatment Group 1 and both control groups increased in body composition from the pretest to posttest. For the sit-ups test, the performance of Treatment Group 1 improved more than Control Group 2. The statistical results were also consistent with what the treatment teachers reported; they placed more emphasis on cardiovascular activities than activities which would contribute to abdominal muscular strength and endurance, or flexibility. Since cardiovascular fitness may be considered the component of fitness most important to the overall health of the individual and very difficult to address in a one-day-a-week, specialist-taught physical education program, the positive effect of improvement demonstrated by the treatment classes on this variable may be the most important result.

Some improvement in fitness probably had occurred in all four classes prior to the treatment because the physical education specialist spent three weeks on fitness information and developmental activities with the students prior to the special program by the two treatment classroom teachers. Throughout the year the specialist encouraged all children to participate in fitness activities which may have had an additional effect.

Further, the normal process of growth and maturation of third grade children would contribute to some change over a seven-month period. Considering that intact, relatively small classes were used in the project, as well as the above factors which would have affected the control and treatment classes similarly, differences between the treatment and control classes on the posttest as well as greater improvement by the treatment classes, is "significant" and indicates that the classroom teacher can have a positive effect on the physical fitness of children.

The physical education profession must seek ways to address the problems that specialists face at the elementary school level. Programs such as the one described here offer a viable alternative to the problem of meeting all program goals when sharing instructional responsibilities with classroom teachers.

References

American Alliance for Health, Physical Education, Recreation and Dance. (1980.) *AAHPERD lifetime health-related physical fitness test manual.* Reston, VA: Author.

Brumbaugh, J.I. (1987) A view of physical education: Perceptions of five classroom teachers. Unpublished doctoral dissertation, the University of North Carolina at Greensboro.

Jewett, A.E., & Bain, I.L. (1985). *The curriculum process in physical education.* Dubuque, IA: Wm. C. Brown.

Patton, M.A. (1980). *Qualitative evaluation methods.* Beverly Hills: Sage.

Pissanos, B.W. (1989). Continued professional learning and the experienced elementary school physical education specialist. Unpublished doctoral dissertation, the University of North Carolina at Greensboro.

Ross, J.G., Dotson, C.G., Gilbert, G.O., & Katz, S.J. (1985). What are kids doing in school physical education? *Journal of Physical Education, Recreation & Dance,* 56(1), 73-76.

Readers wishing a more complete report of the analyses and results may contact the authors.

Academic Learning Time in Elementary School Physical Education (ALT-PE) for Student Subgroups and Instructional Activity Units

Stephen Silverman, Patt Dodds, Judith Placek,
Shirley Shute, and Frank Rife

A broad goal commonly held by pedagogical researchers in physical eduation is that of identifying teacher actions which consistently are related to high levels of student achievement m, more specifically the attainment of proficient movement skills. A fundamental question, however, must be asked about the best measures of student achievement. Physical educators have a particular measurement problem because student performance products are often flowing series of movements, each one unique, temporary, and nonreproducible (e.g., an individually strutured dance, a tumbling pass in gymnastics, or an offensive effort by field hockey attack players). Academic Learning Time (ALT), a recent refinement of the time-on-task concept (Bloom, 1980; Carroll, 1963) has become a useful indirect measure of student achievement in cases where permanent products are difficult to collect. ALT originally was developed and used in the Beginning Teacher Evaluation Studies (BTES) (Fisher, Filby, Marliave, Cahen, Dishaw, Moore, & Berliner, 1978) and has since been modified and used in physical education settings (Siedentop, Birdwell, & Metzler, 1979).

This paper will compare the combined data from two previously reported studies which focused on ALT-PE variables (Placek, Rife, & Silverman, 1982). The data provide a large base from which to make relevant situational comparisons for a variety of important instructional variables. The purpose of this investigation is to examine differences in the ALT-PE subcategories of (1) engaged in motor or cognitive activity, (2) engaged in motor practice, and (3) engaged in motor practice at an easy difficulty level, for two different instructional situations, for different activity units, and for student characteristics of sex, skill level, and special-needs status.

Method

A brief overview of the subjeccts, student subgroups, activity units, instrumentation, and observation procedures are presented. The reader is referredto other studies based on this data for greater detail (Placek, Silverman, Shute, Dodds, & Rife, 1982; Shute, Dodds, Placek, Rife, & Silverman, 1982).

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Subjects

The subjects were two large groups of elementary students in two schools with different teachers. The teacher in Situation 1 was a one year replacement for a colleague on sabbatical leave. The program at this school was described as a movement education approach, using Laban's space, time, force, and flow concepts as the basis for planning learning activities and tasks for children (Graham, Holt-Hale, McEwen & Parker, 1980; Laban, 1948; Laban, 1948).

The students in Situation 1 included 105 children (60 boys and 45 girls) in 20 kindergarden through sixth grade classes observed. Of 147 observations made, 89 were of boys and 58 of girls. Eleven students (nine boys and two girls) wete mainstreamed special-needs children as diagnosed under Massachusetts Chapter 766 and Federal Law 94–142. Of 15 observations made on these children, 13 were of boys and 2 of girls.

The teacher in Situation 2 was an experienced teacher (19 years at the school) who basically utilized a traditional sports and games curriculum in teaching, although the teacher did experiment for a short time with a "movement exploration" approach.

The students in Situation 2 included 24 girls and 29 boys in the first, third, and fif th grades. Of the 53 students, eight (one girl and seven boys) were mainstreamed special-needs children. Of 123 total observations made, 51 were of girls and 72 of boys.

Student Subgroups

Student data were subgrouped by sex to compare girls' ALT-PE patterns with those of boys. A second subgrouping was made to compare mainstreamed special-needs students' ALT-PE patterns with those of students without special needs. For the third subgrouping (student skill level), each teacher was required to list names of the five most highly skilled and of the five most poorly skilled students in that activity early during the unit of instruction.

Activity Units

A final subgrouping was obtained in each of the instructional situations by organizing data by instructional activity units: a) manipulative skills, b) movement experiences, and c) team sports.

In Situation 1, 37 children were observed during manipulative skills units, 8 during movement experiences, and 82 during team sports instruction. The total observations of activity in this situation do not add up to the total of 147 due to other instruction which was not classified within the three activity units. In Situation 2, 12 students werte observed in manipulative skills, 8 in movement experiences, and 103 in team sports.

Instrumentation

Specific adaptations of the ALT-PE instrument used in this study have been detailed elsewhere (Siedentop et al., 1979). A corollary decision log specific to this study is available from the authors. The scored-interval method (Hawkins & Dotson, 1975) was used to calculate interobserver agreement (IOA) for the total instrument and for each of the ALT-PE categories.

Observation Procedures

The sampling procedures in this study were designed to increase the number of students observed in any one setting by randomizing the selection process instead of continually observing the same few students at each observa..in session. A random numbers table was used to generate, from a given class roll, names of children to be observed during each observation. Class sessions ranged from 19 to 39 minutes in length, and coders completed three to seven sets of 30-interval lines of recording during each session.

Data Analysis

The subgroups within the grouping of activity units and special-needs status had grossly unequal Ns, making inferential statistical analysis of these data inappropriate. Therefore, the data related to these two variables for each instructional situation will be presented with descriptive statistics and analysis for the ALT-PE categores of Learner Moves-Engeged, Motor Response, and Motor Response-Easy.

The data for situation, sex, and skill level were analyzed using a 2 x 2 (Situation x Sex) MANOVA and a second 2 x 3 (Situation x Skill Level) MANOVA. Each MANOVA had as dependent measures the three categories of the ALT-PE system (Learner Moves-Engaged, Motor Response, Motor Response-Easy). Significant main effects were followed up by discriminant analysis.

Those dependent measures predicting group membership then were analyzed with ANOVA and ANCOVA to determine which levels of the variables werte responsible for differences (Bray & Maxwell, 1982). Where situation was a significant main effect in the MANOVA, only one set of follow-up procedures are reported.

Results

Interobserver Agreement

Following initial training, observers of students in each situation maintained high agreement throughout the data collection period. For Situation 1, four IOA checks ranged from .83 to 1.00. For Situation 2, five IOA observations ranged from .86 to 1.00.

ALT-PE for Subgroupings

When all students were grouped together, 33.6% of the total class time was spent engaged with the subject matter (Learner Moves-Engaged), 17.1% in Motor Response, and 11.5% in a motor response at an easy diffeculty level (Motor Response-Easy). For students in Situation 1, time spent at Learner Moves-Engaged was 43.9%, Motor Response 20.2%, and Motor Response- Easy 12.7%. In Situation 2, students spent 21.4% of class time Learner Moves-Engaged, 13.4% in a Motor Response, and 10.0% at Motor Response-Easy. The MANOVAs for situation by sex and situation by skill level each showed a significant main effect for situation as evidenced by the Wilke's lambda of .609, which resulted in $F(3,267) = 56.52$ ($p < .0001$). No other main effect or interaction was significant for sex or skill level; descriptive statistics are presented in Table 1. The follow-up discriminant analysis had Learner Moves-Engaged enter the equation first, $F(1,268) = 106.28$, $p < .002$, $\omega^2 = .28$, followed by Motor Response-Easy, $F(1,267) = 45.01$, $p < .001$, $\omega^2 = .14$, indicating that these variables were responsibelfor differences in the original linear composite. Since there were only two levels of situation, additioanl follow-ups with ANOVA and ANCOVA are not reported.

The effect of special-needs status and activity unit on the sependent measures will be presented descriptively. In Situation 1, minor differences exist between special-needs and nonspecial-needs students at the ALT-PE levels of Learner Moves-Engaged and Motor Response (see Figure 1). However, at the level of Motor Response-Easy, which is suggested to be the most important for motor skill acquisition, nonspecial-needs students' percentages are more than twice those of special-needs students—13.4% and 6.5%, respectively. In Situation 2, similar, but slightly different, percentages occur; no special-needs students' Motor Response-Easy levels are approximately 60% higher than those for special-needs students.

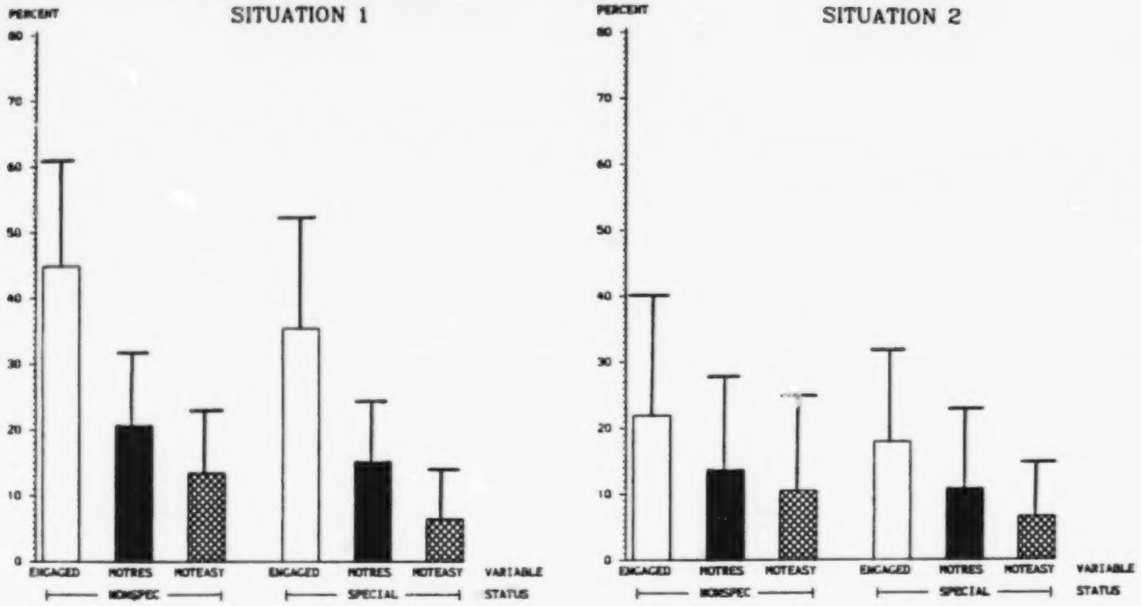
The results related to activity units show much higher levels of ALT-PE for movement experiences and manipulative skills than for team sports. Whan all students from both situations were grouped together, Learner Moves-Engaged was 54.8% (SD = 16.2) for movement experiences, 50.9% (14.7) for manipulative skills, and a much lower 24.3% (16.8) for team sports. This continues for the Motor Response category [movement experiences—37.0% (16.5), manipulative—28.0% (13.1), and team sports—10.4% (8.2)] and finally where differences are just as pronounced in the Motor Response-Easy Category [movement experiences—30.9% (17.1), manipulative skills—15.9% (11.6), and team sports—6.8% (6.5)].

Table 1
ALT-PE Descriptive Data for Situation, Sex, and Skill Level

		Sex		Skill Level		
		Girls	Boys	High	Medium	Low
Situation 1	(N = 147)	(N = 58)	(N = 89)	(N = 48)	(N = 65)	(N = 34)
Learner Moves-Engaged	43.9 (16.5)	43.2 (16.8)	44.9 (16.0)	46.4 (15.4)	41.9 (17.8)	44.0 (16.1)
Motor Response	20.2 (12.0)	20.8 (12.5)	19.2 (11.3)	23.2 (10.5)	17.4 (11.3)	21.3 (14.3)
Motor Response-Easy	12.7 (10.0)	13.1 (10.5)	12.2 (9.2)	15.5 (10.0)	10.5 (9.2)	13.0 (10.6)
Situation 2	(N = 123)	(N = 51)	(N = 72)	(N = 21)	(N = 78)	(N = 24)
Learner Moves-Engaged	21.4 (19.3)	22.4 (17.2)	20.0 (22.2)	28.0 (19.3)	20.5 (18.6)	18.6 (21.1)
Motor Response	13.4 (15.4)	14.4 (13.9)	11.9 (17.3)	19.0 (16.4)	12.2 (14.4)	12.3 (17.2)
Motor Response-Easy	10.0 (13.6)	11.0 (11.9)	8.6 (15.7)	14.6 (15.5)	9.3 (13.1)	8.4 (13.0)
All Students	(N = 270)	(N = 109)	(N = 161)	(N = 69)	(N = 143)	(N = 58)
Learner Moves-Engaged	33.6 (21.0)	33.8 (19.9)	33.3 (22.7)	40.8 (18.4)	30.2 (21.0)	33.5 (22.1)
Motor Response	17.1 (13.5)	17.9 (13.5)	15.8 (14.8)	21.9 (12.6)	14.6 (13.3)	17.6 (16.0)
Motor Response-Easy	11.5 (11.8)	12.1 (11.1)	10.5 (12.7)	15.2 (11.9)	9.8 (11.4)	11.1 (11.8)

Note: Values are mean percentage of total class time with standard deviation.

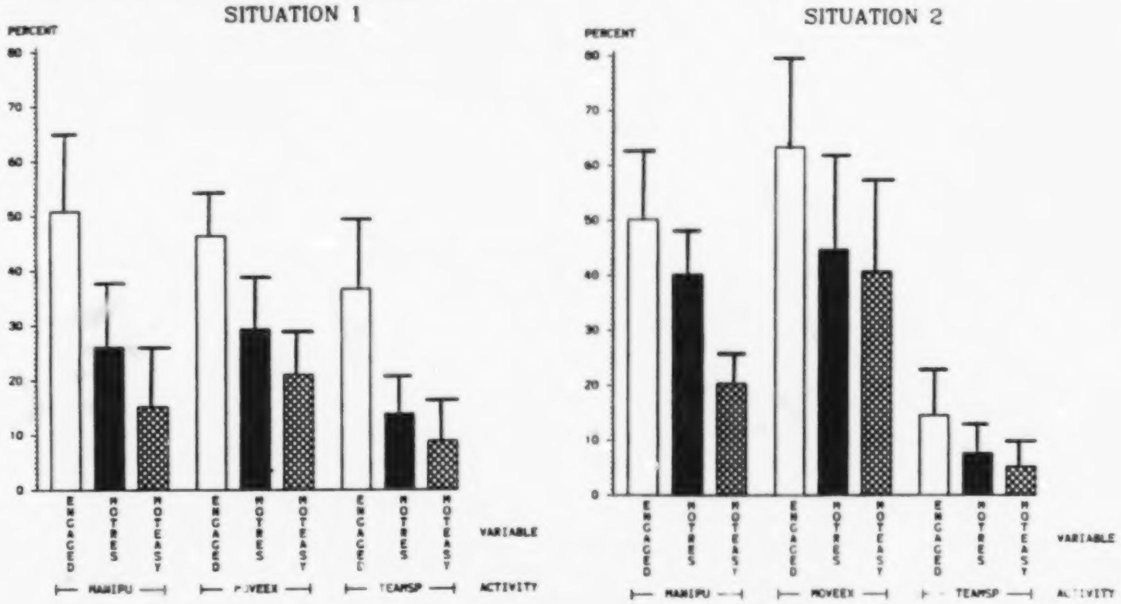
Figure 1—ALT-PE for special-needs and nonspecial-needs students.



LEGEND:
ENGAGED - ENGAGED TIME NONSPEC - NONSPECIAL NEEDS
MOTRES - MOTOR RESPONSE SPECIAL - SPECIAL NEEDS
MOTEASY - MOTOR RESPONSE-EASY

NOTE. VALUES ARE MEANS WITH STANDARD DEVIATIONS.

Figure 2—ALT-PE for instructional activity units.



LEGEND:
ENGAGED - ENGAGED TIME MANIPU - MANIPULATIVE SKILLS
MOTRES - MOTOR RESPONSE MOVEEX - MOVEMENT EXPLORATION
MOTEASY - MOTOR RESPONSE-EASY TEAMSP - TEAM SPORTS

NOTE. VALUES ARE MEANS WITH STANDARD DEVIATIONS.

As shown in Figure 2, this trend of team sports having the lowest levels of ALT-PE is found in each situation to some degree. Although large differences appear in Situation 1 for Motor Response-Easy, more marked differences between activity units are evident in Situation 2, in which the team sports unit percentages are small in comparison to those for the manipulative skills and movement experiences units.

Discussion

Neither student sex or skill level was a significant variable accounting for differences in ALT-PE, but instructional situation was significantly different in the MANOVA analyses. It may be that sex or skill level of students does not differentially affect learning time per se, even though these same student characteristics appear to affect ways in which teachers directly interact with students (Brophy & Good, 1974; Martinek, Crowe, & Rejeski, 1982). This suggests that learning time is a somewhat different type of variable in the teaching-learning environment than is teacher-student interaction.

The significance of situation, particularly in the absence of other main effects or interactions, indicates that this variable was more powerful than the two student characteristics examined. Girls and boys, and students of high, medium, and low skill levels, were all provided relatively equal learning opportunities within each situation, but students in one situation had different Learner Moves-Engaged and Motor Response-Easy percentages than those in the other setting. (The high correlation between Motor Response and Motor Response-Easy may be the reason that the intermediate Variable, Motor Response, was not a predictor of situation in the discriminant analysis.)

Similar ALT-PE percentages were demonstrated by special-needs and nonspecial-needs students for Learner Moves-Engaged and Motor Response, but the nonspecial-needs students were engaged in a motor response at an easy difficulty level about twice as often as the special-needs students, overall and in both situations. Apparently, both teachers were successful in providing equal time to be engaged with physical education content and to make movement responses, but were not able to help special-needs children be as successful as their normal counterparts.

Perhaps neither teacher was able to break down learning tasks into small enough steps for the special-needs students to achieve maximum success in a progressive manner as they learned complex motor skills. It also is possible that the types of skill feedback given special-needs students was inadequate to cause significant changes in their motor performance. These results appear to support other ALT-PE studies in which special-needs students accumulated much less Motor Response-Easy time than nonspecial needs students (Aufderheide, McKenzie, & Knowles, 1982).

In the total sample and in Situation 2, activity units showed the same relative position in percentage reported for the three ALT-PE variables. Movement exploration had the highest percentages, followed by manipulative skills, and then team sports for Learner Moves-Engaged, Motor Response, and Motor Response-Easy. Situation 1 differed only in showing a reversed position for manipulative skills (first) and movement exploration (second) for Learner Moves-Engaged.

It is probable that different patterns used for organizing students in each activity unit accounted for the differences seen in this study. If the same student grouping schemes were used in all three activity units, it is surmised that the ALT-PE percentages would be more similar, regardless of specific subject matter content.

The differences found in this study for ALT-PE accrual, based on student special-needs status, type of activity unit, and instructional situation, indicate these are relevant factors which may account for similar ALT-PE differences for other teachers and settings. Further, the evidence presented here contraindicates student sex and skill level as factors influencing the accumulation of differing amounts of ALT-PE. It is perhaps time to design a careful series of studies to determine relative effects of the variables which were shown in this investigation to influence ALT-PE.

Once relative effects are established teachers will be better able to take these factors into account when planning their classes to provide maximal learning time for all students, regardless of activity unit or special-needs status. In addition, it seems appropriate for investigations to focus on the relationship between ALT-PE and the organizational patterns of students for practicing motor skills to confirm or disconfirm the notion that managerial arrangements affect students'learning time.

References

Aufderheide, S., McKenzie, T., & Knowles, C. (1982). Effect of individualized instruction on handicapped and non-handicapped students in elementary physical education classes. *Journal of Teaching in Physical Education*, I (3), 51-57.

Bloom, B. (1980). The new direction in educational research: Alterable variables. *Phi Delta Kappan*, 61, 382-385.

Bray, J.H., & Maxwell, S.E. (1982). Analyzing and interpreting significant MANOVAs. *Review of Educational Research*, 52, 340-367.

Brophy, J., & Good, T. (1974). *Teacher-student relationships*. New York: Holt, Rinehart & Winston.

Carroll, J.B. (1963). A model for school learning. *Teachers College Record*, 64, 723-733.

Fisher, C., Filby, N., Marliave, R., Cahen, L., Dishaw, M., Moore, J., & Berliner, D. (1978). *Teacher behaviors, academic learning time, and student achievement: Final report of Phase III-B, Beginning Teacher Evaluation Study*. San Francisco: Far West Regional Laboratory for Educational Research and Development.

Graham, G., Holt-Hale, S., McEwen, T., & Parker, M. (1980). *Children moving: A reflective approach to teaching physical education*. Palo Alto, CA: Mayfield.

Hawkins, R., & Dodson, V. (1975). Reliability scores that delude: An Alice in Wonderland trip through the misleading characteristics of interobserver agreement scores in interval recording. In E. Ramp & G. Semb (Eds.), *Behavior analysis: Areas of research and application*. Englewood Cliffs, NJ: Prentice Hall.

Laban, R. (1948). *Modern educational dance*. London: McDonald & Evans.

Martinek, T., Crowe, P., & Rejeski, W. (1982). *Pygmalion in the gym: Causes and effects of expectations in teaching and coaching*. West Point, NY: Leisure Press.

Placek, J., Silverman, S., Shute, S., Dodds, P., & Rife, F. (1982). Academic learning time in a traditional elementary physical education setting: A descriptive analysis. *Journal of Classroom Interaction*, 17 (2), 41-47.

Shute, S., Dodds, P., Placek, J., Rife, F., & Silverman, S. (1982). Academic learning time in elementary school movement education: A descriptive-analytic study. *Journal of Teaching in Physical Education*, 1, (2), 3-14,

Siendentop, D., Birdwell, D., & Metzler, M. (1979). A process approach to measuring teacher effectiveness in physical education. Paper presented at the Annual Conference of the American Alliance of Health, Physical Education, Recreation, and Dance, New Orleans.

The National Children and Youth Fitness Study II:

A Summary of Findings

James G. Ross   Russell R. Pate

The information from NCYFS II suggests that current programs may be inadequate to promote lifetime fitness. Study findings challenge policy makers, researchers, teachers, and community members to make informed decisions about actions needed to enhance the future fitness and physical activity habits of our children.

Many people believe that children are naturally active and fit. Yet, incongruously, media pundits warn that the adult fitness boom has failed to trickle down to our children, as if children needed motivation to be physically active. Although younger school children rank physical education as their favorite subject (Gallup, 1985), high school juniors and seniors generally choose not to take physical education as one of their electives (Ross & Gilbert, 1985).

Not long ago, it was widely believed that degenerative diseases, such as atherosclerosis, begin in middle age. Now we know that such afflictions have their roots in childhood and that, by intelligent behavioral choices, we can sharply reduce our risks of degenerative disease. Within the range of choices, participation in a regular exercise regimen is one of the best ways of lowering risk and reducing the occurrence of degenerative diseases (Powell, Thompson, Caspersen, & Kendrick, 1987).

While advertisers publicize the association between their products and an active lifestyle, statistics show that no more than 10 percent (Caspersen, Christenson, & Pollard, 1986) to 30 percent (Schoenborn, 1986) of adults participate in regular, vigorous exercise.

Are children naturally active and fit? For the sake of argument, let us assume that, until the age of 10 or so, they are. What changes as children grow older? As parents, teachers, and members of society at large, are we failing to nurture this healthy inclination? Do schools punish children for being active, much akin to the process of breaking a wild horse? As parents, do we use the television too often to control behavior? Are we intolerant of a child's need for physical activity? Are we perhaps not pushing our children hard enough to remain active? Are we perhaps not pushing our children hard enough? Or are we pushing the few too quickly into competitive sports to the near exclusion of the many? Do we offer children the right options? Are adequate resources for exercise made available at home, at school, and in the community? Do we set the right example by our own lifestyles? Have we made it too easy for children to adopt a sedentary lifestyle? As children mature and become more self-conscious, is it natural that physical activity take a lower position on their list of priorities? In the final analysis, this question must be addressed: What needs to happen to foster a national commitment to lifetime fitness?

Against this background, the second National Children and Youth Fitness Study (NCYFS II) was launched to study the physical fitness and physical activity habits of children ages six to nine. Specifically, the study is the first to assess the fitness of six- to nine year-olds, to describe their patterns of participation in physical activity, and to determine the factors affecting their fitness. This article describes the impetus behind the study, methods of collecting data, and major study findings.

Impetus behind NCYFSII

The original National Children and Youth Fitness Study (NCYFSI), limited to 10-to 18-year-olds, was designed to gather baseline data related to national objectives in physical fitness and exercise (Ross & Gilbert, 1985). The landmark document, *Promoting Health/Preventing Disease: Objectives for theNation* (1980), set as objectives that 90 percent of10- to 17-year-olds will participate in vigorous exercise, 60 percent will be enrolled in daily physical education, and 70 percent will participate in periodic fitness testing by 1990. Two other objectives call for data for monitoring patterns of participation in physical activity and for evaluating the short- and long-term health benefits of exercise.

There were three reasons for extending the NCYFS I to younger children. First, in the official midcourse review of the 1990 objectives for the nation, professionals in the field argued that greater attention to early elementary school children would improve prospects of reaching older children and adolescents (Powell, Spain, Christenson & Mollenkamp, 1986). Second, when finding of NCYFS I were released in 1984, the general public and the media repeatedly asked why younger children were excluded. In essence, they argued for lifetime fitness. Third, the U.S. Department of Education's 1986 report, *First Lessons: A Report on Elementary Education in America*, acknowledged the importance of physical education programs in schools, "not only because they promote health and well-being, but because they contribute to academic achievement" (Bennett, 1986).

Project history

NCYFS II began in October 1985 with the convening of two panels to help design a battery of fitness tests and a survey of physical activities. Fitness test and survey protocols were developed, extensively pilot-tested, and refined. Data were collected between September and November 1986 from a nationally representative sample of 4,853 students in 19 states, of whom 4,678 participated. In addition, 4,435 of the parents of participating students in completed a parent survey. The participation rates of over 96 percent for children and 94 percent for parents are extremely high for a survey of this type.

Study questions

NCYFS II posed three general questions about the fitness and physical activity habits of American six- to nine-year-olds:

(1) How do children in grades 1 to 4 perform on health-related tests of physical fitness?

(2) What are the physical activity habits of children at home, at school, and in the community?

(3) What factors, including exercise habits, affect measured fitness?

The question about performance on fitness tests was primarily intended to produce descriptive statistics: i.e., fitness norms that describe the population, provide a baseline for tracking changes over time, and allow comparison of individual students against the population. Compared to national data obtained in the 1960s, NCYFS I detected an increase in the body fatness of 10- to 18-year-olds (Ross & Gilbert, 1985). It was also intended for NCYFS II to examine whether such changes occurred in six- to nine-year-olds.

Several questions were posed regarding physical education programs: What percentage of younger children ar enrolled? Do they take physical education classes with sufficient frequency? What percentage take it daily? Do most take it from a certified physical education specialist rather than a classroom teacher? Are classes held in a suitable physical environment? What types of activities are most frequently offered? Are the children periodically tested for physical fitness? In testing, is the focus on health-related fitness or motor performance? How do extracurricular physical activity programs fit into the picture? Are recess periods used to supplement or to substitute for physical education? Most important, do physical education programs provide support for lifetime fitness?

Regarding home and community, such questions were posed as: What percentage of children make use of community organizations—such as sports teams, YMCA's, parks and recreation department programs, and scouting—as sources of exercise? In what physical activities do children engage through such organizations? Do parents and teachers perceive children as being rather sedentary? Are children who watch greater amounts of television actually less active and less likely to participate in community organizations? What models do parents set by their own exercise patterns? How often do parents exercise with their children?

Finally, it was asked: What are the relationships of the child's own activity levels, the child's participation in community organizations, parental exercise behavior, and the school physical education program to the measured fitness of the children?

Data collection procedures

The parents of the participating children first filled out a survey describing their own and the child's physical activity patterns. The survey was administered in conjunction with a parental consent form. Information about the school physical education program was collected directly from teachers. Next, each of the 4,678 participating children completed a set of fitness tests. Cardiorespiratory endurance was measured through a one-mile walk/run (age 8 and over) or a half-mile walk/run (under age 8). A sit-and-reach test using a special apparatus measured lower back/hamstring flexibility. Upper body muscular strength endurance was tested by a modified pull-up in which the in which the student's heels remain on the floor. Timed, bent-knee sit ups, with the students's arms folded across the chest, measured abdominal strength/endurance. Finally body composition (degree of fatness) was measured by triceps, subscapular, and medial calf skinfolds.

Testing procedures were designed to maintain control over the quality of collected data. Well in advance of the scheduled testing date, teachers demonstrated all of the tests and provided students with an experience in paced running. A roving cadre of trained specialists actually administered the tests to students one-on-one except for the distance run, which was administered in small groups. The role of the teacher in data collection was primarily limited to assistance in administration of the distance run.

The new norms

NCYFS II developed new health-related fitness norms by age/sex and grade/sex for each of the fitness tests listed above.

The study marked the first occasion on which most of these tests were administered to a nationally representative sample of six- to nine-year-olds. The norms are considered highly accurate at every fifth percentile. Average scores can be seen in Exhibit 1.

Each of the five tests is intended to measure one or more aspects of an individual's current health and potential resistance to disease. Poor performance on the sit-and-reach and sit-up tests indicates the possibility that an individual might develop lower back or other musculoskeletal problems due to inadequate flexibility and/or poor abdominal strength.

Distance runs measure the generalized capacity of the cardiovascular system; maintaining a high capacity may reduce an individual's risk of heart disease.

A high degree of body fatness, as shown by skinfold thickness, helps to predict vulnerability to a wide range of degenerative diseases, including hypertension, heart disease, diabetes, psychological disorders, and impaired tolerance for heat.

Upper body strength as measured by modified pull-ups indicates an individual's ability to perform certain functional tasks required in day-to-day living without undue exertion or risk of injury.

Exhibit 1. Average Score for Boys and Girls on the NCYFS II Fitness Tests by Age

		Boys				Girls			
Test Item	Fitness Dimension Measures	6	7	8	9	6	7	8	9
Sum of Triceps, Subscapular and Medial Calf Skinfolds (mm)	Body Composition	24.56	26.36	28.91	32.07	30.55	32.25	36.11	39.16
Sit-and -Reach Inches)	Flexibility	13.23	13.19	13.03	12.61	14.10	14.37	14.09	14.05
Bent-Knee Sit-Ups (Number in 60 Seconds)	Abdominal Strength/ Endurance	18.41	22.38	25.20	27.89	17.79	21.42	23.89	25.49
Modified Pull-Ups (Number Completed)	Upper Body Strength/ Endurance	7.28	9.16	10.58	11.51	6.64	8.08	8.58	8.92
Mile Walk/Run (Minutes and Seconds)	Cardiorespiratory Endurance			11:04	10:37			11:58	11:35
Half-Mile Walk/Run (Minutes and Seconds)	Cardiorespiratory Endurance	5:31	5:10			5:48	5:33		

Changes in body fatness

Population-wide changes in physical fitness are matters of scientific and practical concern because they imply alterations in the capacity to work and play, adjustments to the quality of life, and shifts in vulnerability to various health problems. Efforts to assess changes in health-related fitness are largely limited to tracking changes in skinfold measurements. Valid national data for most tests of health-related physical fitness were not collected prior to the mid-1980s.

Comparison of NCYFS II scores for triceps and subscapular skinfolds to data previously collected by the National Center for Health Statistics in 1963-1965 provides evidence that six- to nine-year-old children carry more body fat than did their counterparts of 20 or more years ago. The median sum of the two skinfolds was two to four mm thicker than in the earlier sample. Further research is needed to verify and further define such apparent changes and to interpret their implications for the health of today's children.

Physical education programs

Nearly all children attend school: therefore, the school plays a pivotal role in influencing their physical fitness and exercise habits. As expected, virtually all first through fourth graders (97.0%) are enrolled in physical education programs of one sort or another. It comes as a pleasant surprise that they take physical education an average of 3.1 times weekly, with 36.4 percent taking classes daily. However, it appears that a two-class system has evolved at an early elementary school level. The "haves" take physical education daily while the"have nots" (37.2%) take physical education only one or two days a week.

It is interesting that the frequency with which schools conduct physical education classes is inversely related to the amount of time the children are given for recess. This suggests that schools are inappropriately using recess to substitute for, rather than to supplement, physical education. Children need discretionary time just as they have a need for physical education instructional time. This also suggests that schools are willing to allocate just so much time to physical activity.

It came as a surprise that over three quarters (76.0%) of children never see a classroom teacher for physical education and that 83.1 percent take class at least once a week with a physical education specialist. However, this finding alone masks the fact that many specialists, perhaps as many as one third, do not hold a valid certification in physical education. There is cause for concern that many schools do not make the investment needed to hire a certified physical education specialist.

In this age group, only 39.3 percent of students typically take physical education in a gymnasium.

Exhibit 2. Rank and Percent Reporting Physical Activities Most Frequently Performed by Boys and Girls in Community Settings, Grades 1-4

Boys	%	Rank	%	Girls
Swimming	.36	1	.39	Swimming
Racing/Sprinting	.33	2	.32	Racing/Sprinting
Baseball	.23	3	.15	Bicycling
Soccer	.21	4	.14	Playing on a Playground
Bicycling	.15	5	.10	Gymnastics
Playing on a Playground	.11	6	.10	Walking
Football	.10	7	.08	Basketball
Basketball	.09	8	.08	Climbing
Climbing	.08	9	.08	Hiking/Backpacking
Hiking/Backpacking	.07	10	.08	Locomotor Skills
Locomotor Skills	.07	11	.08	Playing (unspecified)
Walking	.07	12	.07	Jumping or Skipping Rope
Calisthenics/Exercises	.06	13	.07	Roller Skating
Playing (unspecified)	.06	14	.06	Soccer
T-ball	.05	15	.05	Games (unspecified)
			.05	Ballet/Square/Folk Dance

This is not in itself cause for alarm because schools in temperate climates usually hold physical education on school grounds. As a result, children who take physical education on school grounds have the benefit of 50 percent more class meetings per week than children who take physical education indoors. However, there is concern that more than f few schools not providing physical education specialists appear to be unwilling or unable to support adequate teaching facilities.

Although 49.5 percent of students have the opportunity to participate in periodic fitness testing, schools generally test for motor performance rather than health-related fitness. A major obstacle is that, by their own admission, teachers are not aware of or do not know how to administer the newer fitness tests.

Only 18.9 percent of students have the opportunity to participate in extracurricular sports and physical activity programs at school; the percentage who actually do is even lower. The most frequently offered activities, in declining rank order, are basketball, jumping or skipping rope, soccer, games (unspecified), baseball/softball, folk/square/ballroom dance, gymnastics, and track and field (not running). Over the four grades, priorities begin to shift in grade 3, as competitive team sports, such as basketball and soccer, replace jumping or skipping rope and rollerskating as top activities.

The most common physical education class offerings in grades 1-4 are, in declining rank order: movement experiences and body mechanics, soccer, jumping or skipping rope, gymnastics, basketball, throwing and catching activities, calisthenics/exercises, rhythmic activities, kickball, relays, running, and baseball/softball. However, grades 1-4 define a period of marked transition, as physical education programs shift from an emphasis on movement education toward greater interest in physical fitness and sports skills. By grade 3 or 4, movement experiences, locomotor activities, and throwing and catching activities give way to competitive team sports, such as baseball/softball, basketball, soccer, and volleyball, which will remain the core of the physical education program throughout high school.

The dramatic shift toward team sports in physical education and extracurricular offerings as early as grades 3 and 4 causes alarm. One of the key assumptions in the *Objectives for the Nation* related to school physical education is that, "school based programs will embrace activities which expand beyond competitive sports." NCYFS I found that present programs for grades 5-12 are not geared to this goal. NCYFS II provides evidence that physical education offerings, testing programs, and extracurriculars in grades 1-4 do not support a goal of lifetime either.

Home and community

Although schools are important to the child's exercise habits, one cannot overlook the roles of home and community, which exert powerful influences in all phases of life among children under age 10. Home and community contribute in significant ways to the physical activity of six- to-nine-year-olds. Nearly all children (84.3%) participate in physical activity through at least one community organization. These organizations include public parks and recreation department programs (65.3%), community-based sports teams or leagues (31.9%),churches and other places of worship (24.2%), YMCA's and YWCA's (13.9%), various health clubs and private spas (18.9%), scouting groups (14.6%), and farm clubs (2.1%). Most community organizations are equally available to boys and girls, at least by grade 4. The exception is sports teams and leagues, which attract twice as many boys as girls.

The activities most frequently performed under the auspices of a community organization, in declining rank order, are: swimming, racing/sprinting, baseball/softball, bicycling, and soccer. The next 11 most popular activities, again in descending order are: Playing on a playground, climbing, locomotor activities and skills, walking, hiking/backpacking, gymnastics, playing (unspecified), basketball, calisthenics/exercises, basketball, calisthenics/exercises, football, and rollerskating. However, there are differences between boys and girls in most frequently performed activities and in the relative importance of the different activities (Exhibit 2). As in school programs, priorities change. Baseball/softball, basketball, football, and hiking/backpacking all move up in importance. Climbing, locomotor activities, and playground play decline.

It is significant that fewer than 30 percent of mothers and fathers of first through fourth graders participate in moderate to vigorous exercise three days a week, which is the amount generally thought to be required for maximum health benefits. Even more alarming is that approximately 50 percent say that they never engage in vigorous exercise.

The frequency with which mothers and fathers exercise with their children can be presumed to communicate to the child something about the parental value associated with exercise. Both mothers and fathers exercise with their children less than one day per week, on the average,. The ones who do are, in large part, the ones who are already setting positive role models by their own exercise with sons and daughters with equal frequency. Fathers, however, spend an average of 50 days per year exercising with sons versus only 35 days per year with daughters. This imbalance is most pronounced in grade 4, suggesting the start of a pattern what may last throughout the school years.

NCYFS II indicates that the average child in grades 1-4 spends an average of two hours and two minutes watching television on school days versus three hours and 26 minutes on weekend days. These results are markedly different from some national studies, but are consistent with others. Regardless, television watching directly take away from time that could be spent in other more constructive activities, including exercise. Children who watch greater amounts of television tend to have lower activity levels and are less likely to participate in organized sports or to engage in physical activity through community organizations.

Parents were asked to rate their own physical activity levels and those of their children against same-sex peers. Among both children and adults, the average male was rated as somewhat above average in physical activity level, while the average female was rated as average for persons of the same age and sex. This mathematical incongruity suggests that there is a very strong bias in how parents and teachers rate children and in how adults rate themselves. Parents tend to view their male children as being only slightly more active compared to same-sex peers than their girls children. However, teachers rate boys as much more active than girls.

Factors associated with fitness

The relationship between physical activity patterns and health-related physical fitness was studies by examining the associations between selected school, community and home physical activity factors and two fitness variables, mile walk/run performance and sum of three skinfold thicknesses. Analyses were conducted with third and fourth graders and were controlled for the effects of age and sex.

The results indicate that the physical activity patterns of children, as reported by their parents and teaches, are significantly related to their physical fitness. Children who perform well on the mile walk/run test tend to participate in more community-based physical activity, to watch less television, and to be rated by their parents and teachers as more physically active. In school, these better performers on the distance run tend to receive more of their physical education instruction from a specialist and have the opportunity to participate in periodic physical fitness testing.

School factors tended *not* to be significantly related to the body composition of children. However, leaner youngsters tended to participate in more community-based physical activities and watched less television. These leaner children were rated as more physically active by both their parents and teachers. It may be particularly important that parental physical activity was associated with body composition of the children. The parents of leaner youngsters were more active and exercised more frequently with their children.

Summary and conclusions

NCYFS II has provided information never before available about physical fitness, physical activity patterns, and factors related to the physical fitness of children in grades 1-4. This information suggests that current programs may be inadequate to promote lifetime physical fitness. Study findings challenge policy makers, researchers, teachers and members of the general community to make informed decisions about actions needed to enhance the future fitness and physical activity habits of our children. Attention needs to be directed to interpreting the results of NCYFS II.

References

Caspersen, C.J., Christenson, G.M., & Pollard, R.A. (1986). Status of the 1990 physical fitness and exercise objectives—evidence from NHIS 1985. *Public Health Reports*, 101(6): 585-592.

Bennett, W.J. (1986). *First lessons: A report on elementary education in America*. Washington, DC: Government Printing Office.

Gallup, A.M. (1985, September). The 17th annual Gallup poll of public attitudes toward the public schools.

Powell, K.E., Spain, K.G., Christenson, G.M., & Mollenkamp, M.P. (1986). The status of the 1990 objectives for physical fitness and exercise. *Public Health Reports*, 101 (1): 15-20.

Powell, K.E., Thompson, P.D., Caspersen, C.J. & Kendrick, J.S. (1987). Physical activity and the incidence of coronary heart disease. *Annual Reviews of Public Health*, 8:253-287.

Ross, J.G. & Gilbert, G.G. (1985). The national children and youth fitness study: A summary of finding. *Journal of Physical Education, Recreation & Dance*, 56(1): 45-50.

Schoenborn, C.A. (1986). Health habits of U.S. adults: The "Alameda Seven" revisited. *Public Health Reports*, 101 (6):571-580.

U.S. Department of Health and Human Services. (1980). *Promoting health/preventing disease: Objectives for the nation.* Washington, DC: Government Printing Office.

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